

Exploring Technological Effects on Customer Experiences in the USA's Consumer
Packaged Goods Industry

A Thesis Submitted to the Faculty of the Advertising Department
in Partial Fulfillment of the Requirements for the
Degree of Master of Fine Arts in Advertising
at
Savannah College of Art and Design

Gauri Chauhan

Atlanta, GA

© November 2024

Gauri Misra-Deshpande, Committee Chair

Judy Salzinger, Committee Member

Sam Eckersley, Committee Member

Table of Contents

List of Figures.....	1
Abstract.....	2
Introduction.....	3
<i>The Shifting Environment for CPG Customer Experiences.....</i>	<i>5</i>
<i>Emerging Multi-Sensory Technologies.....</i>	<i>6</i>
Conventional CPG Sensory Elements of Design.....	8
<i>Color Psychology in Packaging Design.....</i>	<i>10</i>
<i>Texture in Packaging Design.....</i>	<i>14</i>
<i>Sound in CPG Marketing.....</i>	<i>16</i>
<i>Transparency and Material Selection in Packaging Design.....</i>	<i>17</i>
Multi-Sensory Technologies in the CPG Industry.....	19
<i>Augmented Reality (AR) Integrated Packaging Design.....</i>	<i>20</i>
<i>Virtual Reality (VR) for Immersive Experiences.....</i>	<i>22</i>
<i>Smart Packaging.....</i>	<i>24</i>
<i>Haptic Feedback and Scent Technologies.....</i>	<i>25</i>
Understanding the CPG Customer Journey.....	27
<i>Pre-Purchase Engagement.....</i>	<i>28</i>
<i>In-Store Experience.....</i>	<i>29</i>
<i>Post-Purchase Interaction.....</i>	<i>30</i>
<i>Analysis of Consumer Behavior.....</i>	<i>31</i>

Evolution of CPG Packaging and Ethical Issues.....	32
<i>Consumer Consent and Data Security</i>	34
<i>Designing with Accessibility</i>	34
<i>Reducing Sensory Overload and Negative Brand Perception</i>	35
<i>The Future of Packaging</i>	36
Conclusion.....	38
Appendix A: Questionnaire.....	41
Appendix B: Visual Design.....	49
Works Cited.....	56

List of Figures

Figure 1: 2lb bag of Tate and Lyle sugar - WW2.....	5
Figure 2: Rico Rico Paelleria's branding.....	13
Figure 3: Green embossed Gucci pattern boxes.....	15

Abstract

Exploring Technological Effects on Customer Experiences in the USA's Consumer Packaged Goods

Gauri Chauhan

November 2024

Ever-changing consumer demands and rapid technological advancements have made the CPG industry extremely competitive and toughened the survival of industry players today. For their growth in the market, CPG brands need to evolve and adapt to the latest technologies persistently. This study explores the impact of multi-sensory technologies on brand-consumer relationships in the CPG sector, especially on enriching traditional packaging design elements. The thesis uses primary and secondary research evidence through questionnaire surveys, articles, and journals to assert that CPG brands should utilize multi-sensory technologies to boost brand loyalty and preference among its target consumers by creating unique and memorable consumer experiences.

Keywords: CPG customer experience, multi-sensory technologies, sensory design, packaging design, human-computer interaction, and brand engagement.

Introduction

Today, the CPG Industry has a significant footprint on the U.S. economy as it is worth more than \$2 Trillion ("Consumer Packaged Goods (CPG) Market Size to Hit USD 3,171.11 Bn by 2032") with primary critical players like Nestle, Procter & Gamble, and PepsiCo (Guerrero) playing a crucial role in determining the industry's fate. The CPG industry deals with various reasonable products that fulfill consumers' daily needs, such as apparel, household supplies, wellness products, cosmetics, and food and beverages. Brands in this industry offer essential products for every home, with a consistent need for replacement and replenishment, maintaining a recurring demand and fueling an intensely competitive environment for all brands.

The estimated growth rate of the CPG sector worldwide from 2022-2028 is at a CAGR of 3 percent ("Consumer Packaged Goods (CPG) Market Is Set to See Revolutionary Growth in Decade"). North America has the largest share of the CPG industry at 35.4 percent ("Consumer Packaged Goods (CPG) Market Size to Hit USD 3,171.11 Bn by 2032"), which signifies that the US CPG industry is operating lucratively and possesses a solid financial position. Out of the many categories of this industry, food and beverage take the lead in sales.

However, the fact that CPG items have a short shelf life (Guerrero) and, unfortunately, manufacturers in this industry face endless crises in securing coveted shelf spaces in retail outlets makes this issue a big hurdle for many brands. These companies always allocate considerable resources to advertising to improve brand recognition and push sales. As per a 2023 Statista report, the US CPG industry has been ranked top under the category of marketing spend with a 5.83% increase in digital

marketing spend and 2.06% in overall marketing spend ("CPG industry advertising and marketing in the U.S."). This data shows a significant trend in increasing marketing expenditures by the CPG brands, which results from the pressure to stand out among the competitors and prevail in the industry.

Another reason for this increased expenditure is the ever-changing consumer demands, changing buying habits, and rapid technological growth (Burley), which shows the need for CPG brands to adapt quickly and respond to emerging technological trends to remain relevant and competitive. Thus, CPG brands always seek ways to capture their consumers' attention and retain it to influence consumers' purchase decision-making while standing out from their competitors.

As these brands constantly invest in unique, innovative marketing strategies and tactics to grab their consumers' attention, they also explore different advertising channels, from digital to traditional ones. According to Google, 75% of CPG shoppers use digital channels to research, browse, inspire, or pick a brand, which shows the significant impact of digital ads on the purchase decisions of CPG consumers (Johnson).

In this fast-paced digital era, consumers have become immune to advertisements as they evolved into natively digital ad-savvy, more informed, and more aware. Thus, many have found themselves distrusting many ads and questioning their authenticity. Moreover, as human attention spans shorten, keeping them engaged with a brand longer becomes more challenging. That is when creating a more interactive and personal experience that is impactful for creating a deeper connection with the consumers.

The industry's cutthroat competition fosters an environment where only the best packaging designs persist apart from the advertisements. Packaging design becomes an essential face of CPG brands, which has much potential to maintain eye contact with consumers while they skim through the shelves, seize that attention, and create a deeper bond with them.

The Shifting Environment for CPG Customer Experiences

Over the last century, brands have realized that packaging is not just a container for food storage; it offers a unique marketing tactic to promote themselves, communicate with consumers, and make the product look appealing, thus eventually driving sales (Bottinelli and Lapatza). The brands realized the importance of visual media in seizing consumer attention long before social media emerged as a marketing tactic. Today's visually-driven world proves the power of attractive packaging in engaging and influencing consumer purchase decisions.

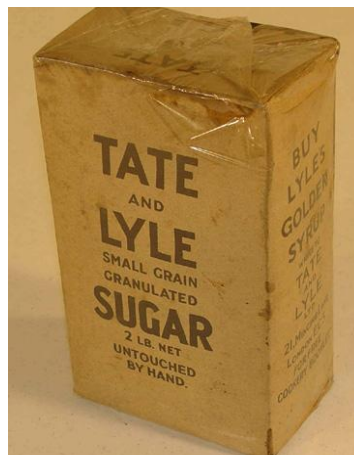


Fig. 1. 2lb bag of Tate and Lyle sugar - WW2, Bridgnorth Museum, (n.d.)

(Bridgnorth Museum Website,

<https://www.bridgnorthmuseum.org.uk/collection/2lb-bag-of-tate-and-lyle-sugar-ww2>).

Earlier, the packaging was quite rudimentary and plain, such as sugar bags (Fig. 1.); however, by the 20th century, it evolved as a brand identity extension using fonts, colors, images, shapes, and illustrations to look attractive. For example, Kitkat and Toblerone packaging has barely transformed, making it an iconic design and building enduring brand recognition, whereas some brands changed packaging designs to stay relevant with their consumers, like Kellogg's cornflakes, Cadbury chocolate bars, and Tate & Lyle Sugar (Bottinelli and Lapatza).

Traditional packaging influences consumer behavior using visual elements like texture, shape, and color. For decades, color psychology, textures, shapes, illustrations, fonts, and images have effectively created a desired brand perception among consumers. Nevertheless, the evolution of technology and its impact on every aspect of human society have transformed the CPG market's needs beyond just functional and emotional appeal.

Emerging Multi-Sensory Technologies

In today's digital era, there has been an increased demand for personalized experiences, emotional connections, and authenticity that correspond with consumers' values among all the bombarded information. Brands must analyze every aspect of the consumer journey, from product details and brand messaging to in-store presentations, to fascinate consumers and attain a competitive edge ("Multisensory Packaging Design Increases Brand Loyalty").

According to Statista (Alsop), by 2024, there will be investments of \$17.6 billion in augmented reality (AR) and virtual reality (VR), and B2C owns 55% of the market share (AR & VR - Worldwide). Also, 76% of consumers get frustrated when their

expectations of more than just personalized interactions are not satisfied by brands (Arora et al.).

It shows consumers demand a personalized, interactive, and engaging brand experience through storytelling. They yearn for experiences that are appealing enough to capture their attention and evoke emotions to attach to the brand. Brands that interact and humanize with their target audiences establishing a deeper connection with them, have the potential to win consumer loyalty and trust.

Research has proven that packaging design can stimulate buying impulses and influence multi-sensory ions through integrated multi-sensory elements ("Multisensory Packaging Design Increases Brand Loyalty"). Thus, brands can foster deeper connections with their consumers and increase brand engagement and preference by developing a personalized experience through sensorial technologies.

This study's primary goal is to scrutinize the overall impact of multi-sensory technologies throughout an average CPG consumer's journey. The research will enclose insights into the impact of these technologies, such as haptic feedback, smart packaging, AR, and VR, on consumer behavior at each touchpoint—the initial discovery of the product, purchase decision, and post-purchase experience. These technologies' potential challenges and advantages in terms of their efficacy in conveying messages, driving sales, and enhancing consumer engagement are explored.

This thesis discusses how CPG packaging can be more effective by integrating multisensory technologies, which can further dramatically influence consumer journeys by creating solid consumer-brand relationships and ultimately enable CPG brands to be unique in the eyes of their potential target audience. This study strives to deliver

valuable insights for integrating emerging sensory technologies in creating consumer experience through multimedia design by evaluating these technologies' impact and ethical concerns.

Conventional CPG Sensory Elements of Design

The most significant battlefield for brand loyalty was grocery store aisles, as millions of products compete for shelf spaces, shopping carts, consumer attention, and homes. The packaging design always has the pressure to influence consumer behavior, which goes beyond just being aesthetically beautiful. To leave an impression on consumers' minds and influence their decisions by touching human senses was essential to create a memorable experience related to a product or the brand (Velasco and Spence). Packaging engineers and designers create more engaging and memorable experiences by integrating sensory design in packaging for CPG brands, appealing to all the senses of touch, smell, sound, taste, and sight (Faria).

An excellent sensory design creates a tantalizing consumer experience with the brand through a strategic approach of scrutinizing and using all the senses, from sight, sound, touch, smell, and taste. CPG brands have been carefully considering and choosing among these sensory elements while designing packaging to grab consumers' attention at the point of purchase. The sensory design elements have the power to craft an indelible experience that enhances consumer engagement and boosts brand loyalty (Faria).

A comprehensive visual neuroscience study revealed that visually salient products could get consumers fixated on them longer than less salient ones (Krishna et al. 46). So, the visual salience approach gives the consumer a higher preference rate

for the product when the individuals focus on a commodity for a longer time (Krishna et al. 46). This proved that the characteristics of a packaging design strongly influence the salience of stimuli and impact the place and duration an individual can focus. Color, Touch, and Image are some factors that affect the visual salience of a packaging design.

Color plays a massive role in influencing purchase decisions. A psychological and scientific study proves that color as a sensory element can directly influence productivity, behavior, mood, and communication (Gordon). Hence, brands can give their target audience impressive effects, advantages, and disadvantages to their target audience by choosing a color. It creates room for applying color psychology when designing packaging. For instance, brighter and more saturated colors, especially those on the red-green axis, are the most visually salient compared to those with blue-yellow color contrast (Krishna et al. 47). For example, bright colors and cute, playful illustrations were used on children's products like Kellogg's to make them appealing to younger audiences. Contrarily, a luxury brand like Nars conveys an elegant and sophisticated vibe by using more dark and shiny colors like black and silver.

Another factor is texture, as the Saliency of Touch exudes a sense of perceived ownership and the feeling of products' freshness, which boosts impulse purchasing (Krishna et al. 50). Texture is one of the vital elements in stimulating emotional responses to the brand and the product. Textures like rough, smooth, raised, or embossed can develop a tactile experience for consumers by forging emotions of luxury, sophistication, warmth, or trust. This approach of using texture is most popular among fragrance and food brands.

Besides visual design, auditory design is also a sensory element as it engages the brand's target audience through sound and noise levels (Faria). Sound is one of the impactful ways to draw the target audience's attention while creating an atmosphere that reduces distractions and stimulates mood and productivity. For instance, Snapple's quirky and refreshing 'pop' sound due to their bottle's metal cap lid became so unique that even after the brand changed their glass bottles into plastic ones, the metal caps were left intact ("Multisensory Packaging – 20 of Our Favorites"). The following subsections discuss how colors, textures, sound, transparency, and material selection influence consumer behavior and purchase decisions.

Color Psychology in Packaging Design

Color has been one of the most prominent sensory design elements since the dawn of packaging design. Different shades, tints, and hues activate various consumer emotions. Research has consistently proven that color influences consumer behavior and taste perception by playing a vital role in communicating product information and quality (Velasco and Spence).

Red shades and tones on the shelves make products appear energetic, youthful, and strikingly vibrant, while blues convey stability and trust (Daggar). Hence, consumers' purchase decisions can be easily influenced when brands strategically select colors through a color psychology approach. Thus, brands can attract their target audiences and improve their market positioning.

Through a strong understanding and execution of competitor strategies and color psychology, brands can optimize their packaging designs and appeal to the US target

market (Daggar). So, the strategic use of color allows brands to reach new consumers while driving their sales.

One of the powerful examples of strategically using color as a sensory design element on the packaging is Coca-Cola's iconic red color, which has conditioned people's minds to remind them about the brand. Hence, it proves that using a specific color for the long term transforms the color into an extension of the brand itself (Daggar). Similarly, many tech companies, like Dell, IBM, and HP, use tones of blue to play on the color psychology of leaving the brand's impression in the consumer's mind as a trustworthy, mature, well-established, and intelligent brand.

Colors can draw attention, trigger emotions, convey product information and brand messages, and distinguish between brands offering similar products (Floyd). Research by marketing specialists revealed that within 90 seconds, consumers subconsciously judge a product (Clark). Moreover, colors are registered comparatively faster than any font, text, complex graphic, or illustration through only color; 90% of them establish that judgment, while 85% determine that color motivates them to buy a specific product (Clark). They have different meanings and affinities that can influence a product's emotional appeal and marketability, thus effectively impacting consumer behavior.

Warm and Vibrant colors: Yellows, reds, and oranges evoke feelings of passion, strength, optimism, happiness, and playfulness (Kenny). Food and beverage brands often use these colors to trigger urgency and provoke hunger. Lays, Fanta, Burger King, McDonald's, and many more use these colors to grab attention and psychologically activate consumer minds by tempting them to taste their products again and again.

Thus, these brands influence consumers' purchase decisions and maintain customer loyalty.

Cool and Calm colors: Purples, greens, and blues motivate feelings of imagination, wealth, eco-friendliness, security, and trust (Kenny). Brands like Cadbury, Unilever, and Starbucks use these colors as part of their brand identity and packaging designs because they appeal to their target audiences (Clark). Blue is also one of the colors preferred by both genders, as they associate it with trust, honesty, and reliability.

Black/White/Grey colors: They can stimulate feelings of purity, elegance, mystery, authority, professionalism, and sophistication. Armani, Ghirardelli, and NYX, professional makeup brands, evoke a sense of luxury and exclusivity by strategically combining these colors with shiny ones like gold and silver.

Beyond these, several shades, tints, and tones of colors activate different feelings, such as pastel colors stimulating feelings of gentleness, relaxedness, femininity, and calmness. Pastels have recently become very popular, as, through an aisle full of various colors yelling for attention, pastels leave a sense of ease on consumers visually ("Color Trends Happening Right Now in Product Packaging"). Some brands like Tiffany & Co., Post-it, and Victoria's Secret use pastel shades they trademarked, like Tiffany Blue, Pastel Yellow, and Soft Pink, respectively.

Some colors are associated with various cultural beliefs and ideologies, such as red, which symbolizes mourning in South Africa, while in China, it symbolizes wealth ("Color Trends Happening Right Now in Product Packaging"). Several MNCs and companies operating across international borders must be aware of choosing the right

colors that convey their brand identity and message while positively fitting into their target audience's culture and beliefs.

Apart from using these individual colors for packaging, a set of colors can be combined strategically to enhance the overall emotional impact and effectively communicate the brand message. For example (Fig. 2.), Rico's packaging design includes a complementary color palette using lighter and darker shades of orange and blue to be more comfortable visually.



Fig. 2. Rico Rico Paelleria's branding, Behance, 2017, Packaging Design
(Behance Website, <https://www.behance.net/gallery/53443913/Rico-Rico-Paelleria>).

Through comprehending color psychology and its emotional impact on consumers, CPG brands can design packaging that conveys the brand story, resonates with its target consumers, and influences consumer preferences.

Texture in Packaging Design

The first moment of the truth is often discovered through human touch. It is proven through studies that brands can design tactile experiences by subconsciously creating a feeling of ownership and value in the consumers (Karangi and Lowe). By physically holding an object, humans can have a sense of ownership, leading them to eventually buy that product as the emotional bond is already established through texture (Zelios). The texture becomes the symbol of the product's quality as those products that feel rough, abrasive, or unfinished are perceived as inferior quality to those with smooth, thick, polished, and heavy textures (Zelios). It is often tempting to touch something with an exciting and unique texture; that is how brands subconsciously associate with consumers.

There are a variety of textures, along with their different emotional associations, that humans tend to create subconsciously. Brands like Nivea lotion and Dove Chocolate use soft and matte textured bottles and packets to give a feeling that the brand wants to be perceived as associated. Soft textures like embossed patterns or paper can give a sense of eco-friendliness, accessibility, and nature to brands that deal with baby products and organic food items. An example could be Guicci's in-store packaging, as shown in (Figure 3) - shopping bags and boxes that are made from cardboard and paper using the brand's decorative pattern embossed in green ("Gucci's Sustainable Packaging – Gucci Equilibrium").



Fig. 3. Green embossed Gucci pattern boxes, Gucci, 2020 (Gucci Website, <https://equilibrium.gucci.com/guccis-sustainable-packaging/>).

Some brands like Tate's Bake Shop cookies, fig bars, Tositos, and many more that sell snacks, energy bars, frozen foods, and related products use crinkly and crispy packages, a smart way to indulge tactile experience and sound. This combination can be memorable and leave a great impression on the consumer's mind while making the consumer tempt them by reminding them about the pleasure of tasting the product.

Silky and shiny textures are often applied to make the product feel extravagant, exclusive, and sophisticated. Brands selling skincare, cosmetics, or innerwear use this texture, especially those who want to position themselves as premium quality. For instance, Augustinus Bader, a skincare brand, uses metallic accents on its copper-colored products. Therefore, this combination of shiny color with metallic smooth polished texture conveys a guarantee of the product's clinical quality, professionalism, and luxury (Cosgrove).

The texture is an impactful design element that adds a decorative touch and develops a holistic emotional experience that elevates consumer engagement levels. However, designers and brands need to be aware of how much texture would be ideal for them. Too tight or abrasive rough textures can leave a negative impression of the brand, and adding those intricate textures can be expensive, and the advantages of having them would be required to consider. To enhance storytelling, brands can create a memorable experience by employing texture in their packaging.

Sound in CPG Marketing

Sound is an element that creates a strong emotional bond through the sense of hearing. This element allows brands to communicate with consumers' unconscious demands and influences their shopping behavior and habits (Shabgou and Daryani). Sound can alter customer behavior, product experience, and brand perception. Customers' sensory experience when eating chips is enhanced by the distinctive sound made when a chip packet is o. It gives the customer a sense of the product's crunchiness and freshness.

According to Pavlov's classical conditioning theory, consumers' expectations of perceived quality and product information can be influenced by the unique sound vibrations of opening a soda can or bottle's lid (Spence). Traditional packaging designs rarely integrate sound; however, over time, brands like Coca-Cola have proven that adding sound to packaging can aid in building brand recognition and skillfully boost the consumer experience.

When a package is opened, it creates a sound that attracts attention and hints at the product's freshness and usability, ultimately amplifying the favorability of purchase

and interaction. Apart from drawing consumers' attention, boosting engagement, and serving considerable functional benefits, the sound element also allows brands to be distinctive and memorable amongst the crowded shelves and competitors (Spence).

For example, Starbucks creates an experience for consumers by making them feel included in the coffee-making process through the sounds of milk frothing and espresso brewed. It ultimately gives consumers a perception of freshness and authenticity ("The Power of Sound: How Brands Use Music and Sound Effects to Influence Consumer Behavior"). Moreover, Coca-Cola's iconic popping sound effectively uses audio branding at its best (Menhorn).

To conclude, Sound is a potent tool underutilized by many CPG brands. However, it can be strategically leveraged in developing packaging design to go beyond resonating with consumers and upgrading product interaction and engagement.

Transparency and Material Selection in Packaging Design

Packaging material is fundamental in developing a sensorial experience, as all the other design elements rely on it. With the current rise in awareness about increasing environmental issues, people have started to prefer brands that support sustainability.

Many brands have reconsidered their packaging materials and designs to satisfy that demand. It is believed that almost two-thirds of Americans perceive packaging using materials like paper and cardboard as more enticing and of premium quality (Niv and Harris). Many Americans prefer these materials as they believe products packaged in paper or cardboard are better for the environment and less profligate. The recyclability factor becomes remarkably appealing, driving them to willingly pay more for that product.

Transparent and eco-friendly materials allow brands to build a sense of trust and safety and form a more authentic and socially responsible brand image (Niv and Harris). For baked goods or organic fruits and vegetables, transparent packaging often indicates freshness and product longevity. The visual clarity that transparency offers develops confidence among consumers and enables them to make well-informed buying decisions.

CPG brands like Kraft Heinz or Pernod Ricard's Absolut Vodka made recyclable and reusable bottles from wood pulp and paper, respectively, to achieve their sustainability goals and influence consumer preference by positioning themselves as environmentally conscious brands (Alexander).

Companies today are endeavoring to reduce environmental impact by exploring the usage of recycled paper, plant-based bioplastics, and food fibers for packaging material. However, decisions to use a suitable packaging material should be carefully considered sustainable, transparent packaging can expose products to air and light, affecting their shelf lives.

CPG brands use a sensory design approach for their packaging to create appealing consumer experiences. They strategically engage human senses to build trust, consumer preference, distinction, and, most importantly, an emotional association. The sensory elements are crucial while designing packaging as they connect the brand with its target audience and influence consumer preference and purchasing behavior.

Future technologies have the potential to satisfy the changing expectations of the consumer market and alter perceptions of luxury or freshness. When sensory design elements are combined with today's advanced technologies, such as Visual Reality

Haptic feedback, Augmented reality, artificial intelligence, etc., they can elevate the overall tactile consumer experience.

Multi-Sensory Technologies in the CPG Industry

Technological advancements have disrupted brand packaging design. Brands always search for better ways to influence consumers' shopping behavior and increase sales. Today's consumers are curious, more aware of the product's environmental impacts, and tech-savvy, so the market demands an experience that is both interactive and positively contributes to the environment.

Brands can leverage technology to develop highly engaging consumer experiences that greatly influence the perceived value and quality of the product, taste inferences, and consumer behavior and response (Krishna et al. 44). They can understand their target consumers more closely and curate an experience through packaging design that is beyond just aesthetics and gives consumers an enjoyable moment to interact with the brand. Today, technology has more potential to draw consumers' attention as it can stimulate emotions by engaging all the senses.

Over time, Traditional packaging has caused a lot of waste and resource deficit. It is also environmentally harmful as it uses more material than needed, and it uses significantly non-biodegradable and non-renewable materials that are hard to recycle, generating more waste (Oloyede and Lignou).

There are several benefits of using technology in packaging design. Product shelf life can be extended using technologies like an active packaging system, barrier coatings, and antimicrobial packaging that controls contamination and maintains freshness (Spence). It allows brands to personalize designs and customize branding

and messaging through variable data printing and digital printing technologies (Spence). Brands realized that personalized packaging sustains targeted marketing strategies, builds memorable consumer experiences, and improves consumer engagement.

Designers can use technologies like 3D printing, virtual reality, and augmented reality to develop distinctive multi-sensory experiences and packaging designs featuring interactive elements. This is achieved through exploring diverse creative concepts, prototyping, and conducting pre-production tests with consumers (Spence). Technology integration can improve a product's usability and buying experience since it allows brands to be creative in creating a compelling and long-lasting narrative.

Augmented Reality (AR) Integrated Packaging Design

Augmented reality (AR) has the power to combine physical and digital worlds by designing an immersive storytelling experience. The brilliant innovation of QR codes and near-field communication tags, known as NFC tags, has enabled brands to create appealing, personalized brand experiences. When AR and NFC are integrated, product transparency and user engagement are improved, and seamless interaction is created ("Augmented Reality and NFC: Bridging the Physical-Digital Gap").

According to the survey conducted for this thesis, out of 114 participants, only 25.4% were aware of AR technology used in packaging design (Appendix 1). It shows that the massive potential of AR has yet to be fully explored and utilized in CPG packaging. The attached NFC tag to the product allows consumers to make well-informed decisions with easy access to detailed product information ("Augmented Reality and NFC: Bridging the Physical-Digital Gap"). It ultimately builds an effective marketing campaign through interactive and consumer-engaging experiences.

AR has revolutionized how products are visualized and how information is accessed in the market. Since it takes much work to picture products before purchasing, this leads to lower confidence in purchase decisions. As per this thesis-related survey, 68.4% of the participants believe engaging and interactive product information can improve an overall experience with CPG products (Appendix 1). It shows that AR is underutilized and can build the experience consumers demand (Skeldon).

Through a 3D interactive way, AR can help brands enable their consumers to visualize and make an informed decision as they can see the product's features and functionalities (Skeldon). For example, Nestlé Hut used AR technology to create an enjoyable experience through a QR code on their cereal boxes that reveals educational games, animated characters, product information, and nutritional benefits (Goodman). It allows brands to create a fun experience to educate and enable consumers to make an intellectual purchase decision based on the sense of trust built by this transparent user experience. AR can blow life into a product by transforming it into an interactive platform through fun quizzes and games that boost brand recall and user engagement.

According to recent news, Snapchat and L'oréal Paris have collaborated with Walmart to promote their Hair color products through a virtual try-on using AR technology (Mzizi). Many brands who deal in the beauty or cosmetics industry are getting their hands on exploring AR to curate consumer experiences where they get to try on them virtually. This game-changing approach helps consumers buy suitable products and also improves convenience.

Another brand, Pizza Hut, developed a gaming experience through AR technology to promote its limited edition pizza box, in which consumers can now play

Pac-Man once they scan the QR code placed on the box (Overstreet). The marketers strategically tied this experience with the hashtag to push players to post their scores online on social media as they got a chance to win the popular Pac-Man gaming cabinet. It shows that product-associated AR games can encourage brand interaction, incentivizing engagement in a fun and challenging way.

Brands could share product-related educational or instructional content if they integrate technology. It will improve the consumer's purchasing experience and foster brand loyalty. Thus, there are endless possibilities for AR technology to be integrated into packaging design. There are possibilities for more regaling and creative experiences through AR to reshape consumer preferences and their interactions with brands.

Virtual Reality (VR) for Immersive Experiences

Virtual reality (VR) is an advanced version of the AR experience. Consumers can fully immerse themselves in the virtual world and experience a 360-degree view of a simulated environment. Recently, VR headsets like Apple Vision Pro and Meta Quest have been in the news as these are the most advanced mediums for experiencing immersive VR. Many brands have been acclimating their marketing strategies to these new VR trends and are trying to develop their product-related VR world experiences that are personalized for their consumers.

A 3d virtual world can be designed by brands to share their evolution, ultimate vision, mission, and how they were created in a storytelling format with their consumers. Furthermore, the VR experience can inform consumers about their product, how it was sourced, what ingredients were used, and how brands contribute to sustainability

practices. It will help brands form strong bonds with their consumers as they interact and engage with the brand's VR experience through packaging. The VR experience can effectively engage all the senses and impact beyond attracting consumers; it builds their interest in the product. Today's generation is curious and instantly wants answers to any doubts or queries. VR can answer them and give them more detailed information about the product in a very engaging and visually appealing way.

One strong example is Nescafé. The brand leveraged VR to curate an experience via its mobile app combined with its branded Google cardboard coffee boxes, which acted as VR spectators transporting consumers to its coffee fields in Brazil ("Nescafé Teams up with Google to Offer First Virtual Reality Coffee Experience"). This helped them build strong consumer relationships and a social media presence.

For instance, a wine-tasting experience in virtual reality can influence consumers' taste perception. A study has discovered that VR dark cafe settings can increase the perceived vehemence of floral aroma (Silva). VR can build highly realistic environments, considering aspects of the world like lighting, temperature, aroma, and many more, all of which are felt using human senses.

The VR approach has some limitations, as the availability and affordability of VR headsets or mediums to transport people into the VR world need to be considered when designing a VR experience. Furthermore, if not designed strategically, adding VR to packaging can exalt complexity, creating confusion and frustration among viewers (Floyd).

Overall, VR allows designers to visualize their prototypes of creative concepts while helping marketers offer memorable and captivating experiences (Velasco and

Spence). Thus, VR leads to higher-quality consumer-centric packaging solutions that are engaging, innovative, and more helpful in differentiating brands and connecting consumers to the brand on a deeper emotional level.

Smart Packaging

Packaging has evolved from just being a container that ensures protection and safety for the product to an information hub regulated by a multi-sensory technology system that stimulates a sensorial consumer experience and increases their engagement with the brand.

Innovative packaging, further divided into intelligent and active packaging, is a package design that uses technology to provide advantages beyond what was previously possible with standard packaging design. Active Packaging helps improve product quality and longer shelf life by actively adding or subtracting any components from packaged food, like unique zip lock bags removing oxygen from packets (Jiang et al. 2). Intelligent packaging offers ways to update consumers about a product's life by tracking its temperature, its condition, and if there are any changes needed in the packaged product or its environment (Jiang et al. 3).

Through Near Field Communication (NFC) technology tags, Radio Frequency Identification (RFID) tags, or QR codes, consumers can digitally access product information, which not only takes them to the brand's website but also shares product details like its location, environment, temperature, current condition, and life duration, or anywhere else online the brand wants to drive consumers' attention.

BabyNes by Nestlé is a fantastic example of how this technology can be integrated. BabyNes elevates how one can quickly and conveniently feed their baby,

just like coffee machines work. RFID technology integrated into their packaging allows parents to safely and precisely prepare the feeding formula by following the correct instructions and formula (Akhzar).

Another exciting example is Axe deodorant's promotional campaign, in which NFC tags were installed in the packaging so consumers could access the campaign's exclusive content on fashion style guides and grooming tips.

Many products were launched using smart packaging techniques as one of the USPs. For instance, cups or containers that leverage temperature sensitivity technology enable their products to change colors, art, or any packaging design element based on hot and cold temperatures.

Smart packaging carves the path of unique consumer experiences for brands to develop that communicate with their consumers in real-time, personalizing the whole experience. Marketers can employ this technology on the exterior and interior of the products, allowing them to get a platform for conveying their brand story and message (Akhzar).

Haptic Feedback and Scent Technologies

As multi-sensory technologies advance, the elements of sensorial experiences expand beyond sound, touch, and sight. When it comes to brands that deal in fragrances, food, and any item that emits a smell that can appeal to consumers and influence their buying decisions and brand preferences, scent-related technologies and haptic feedback come into play (Peralta and Arigami). Sensory technologies are changing the dynamics of designing retail experiences as they can hamper human senses.

Haptic technology can encourage consumers to sense the traditional sensory elements like the product's texture or smell. For example, Heineken redesigned its bottles to improve grip and distinguish itself from other brands by developing a tactile experience (Pittilla). Consumers could feel the product's freshness through touch as Heineken's redesigned bottles have a textured surface employing tactile ink. It also created a sense of brand identification for Heineken's consumers (Pittilla). The redesign was well thought out and strategic as their beer glass perfectly fit human hands, improving the user's grip and elevating the overall product consumption experience.

Scent has proven to be a highly memorable element among all the other senses as it has the power to trigger memory and related moments. Brands have been using scent-releasing packaging to sweeten product appeal. Many brands dealing in detergents, for example, Lenor Unstoppables, added a detachable cap with tiny holes acting as doorways to smell the fragrance of detergent without unlocking the bottle. Similarly, multiple mechanisms have been innovated to integrate scent into packaging. Like Squeeze & Sniff, as used by Lenor, Touch-activated, where fragrance is released when in physical contact, and induction-sealed closure, in which a liner emits the product's fragrance.

Research has proven that pleasant fragrances have a positive impact on driving sales. There have been cases where sports goods sales have been boosted by 80%, and coffee products like Starbucks noticed a 300% increase in their sales due to the integration of fragrance in the consumer experience ("Packaging With Scents").

Scented packaging and haptic feedback are comparatively newer technologies with immense potential to curate extraordinary Multi-Sensory experiences. However,

they have yet to witness significant developments. For Marketers and designers, it is important to consider the complementary nature of these technologies and strategically use them at several stages of the consumer journey (Peralta and Arigami).

As these technologies constantly advance, there is potential to experience unique multi-sensory elements through packaging as CPG consumers. As these technologies can evoke a combination of human emotions just by sensorial experiences, they can significantly impact consumers' buying decisions, preferences, and relationships with brands.

Understanding the CPG Customer Journey

The consumer journey helps brands understand the preferences and demands of their target audiences, which is also greatly beneficial when designing packaging for their products (Fofana). Moreover, brands need to analyze the impact of multi-sensory technologies on each stage of the consumer journey to ensure their effectiveness.

The consumer journey has several stages, starting with product awareness, followed by consideration, purchase, and post-purchase feedback.

- Awareness: This is the first stage in which brands try to grab consumers' attention and make them aware of their product offerings through marketing channels such as Word-of-mouth, advertising campaigns, and social media (Hamilton and Price 188).
- Consideration: At this stage, consumers are well aware of the brand and its product; however, they are still reviewing other options based on price,

packaging design, brand reputation, or their peer suggestions (Hamilton and Price 188).

- Purchase: The consumer has now decided to purchase the product, but they are seeking which platform to purchase through based on their convenience and time.
- Post-Purchase: At this stage, consumers have already purchased the product and are evaluating whether it satisfies their needs or whether they will repurchase it.

By comprehending the consumer experience at various touchpoints and carefully integrating the technologies mentioned above across the consumer journey, brands can create unified, captivating, and sensory experiences.

Pre-Purchase Engagement

The pre-purchase stage is the initial stage of the consumer journey. The brand attempts to draw attention to its goods and generate interest by emphasizing the consumer's demand as gratifying or using visual salience. At this stage, a visually appealing packaging design can help brands unconsciously or subconsciously gain consumers' attention and make them curious or tempted to investigate more about that product closely (Krishna et al. 51).

At this stage, consumers often start their online research and discover the brands that offer satisfactory products or investigate more about any product that fulfills their needs. The multi-sensory packaging designs enable brands to influence consumers'

purchase decisions by communicating the product's information visually or verbally via any or all of the sensory elements (Krishna et al. 51).

Here, technologies like AR, VR, Haptic feedback, or scent technology in packaging design can increase consumers' understanding of the product's quality and usage, as well as the brand's story, ultimately making them subconsciously build a bond as they share moments with the brand through this multi-sensory packaging experience.

Research has proven that social media directly influences consumers' pre-purchase stage by motivating them to identify their product needs through social media advertising (Nyagucha). Brands can also use the above-discussed technologies on social media platforms to influence consumers' searches and opinion formation.

It can be done using either static or video content. However, video content is comparatively more popular today as TikTok and Instagram reels are where consumers spend most of their time. Hence, these mediums can influence consumer decisions using interactive and engaging content and advanced technologies to develop compelling consumer experiences.

In-Store Experience

Based on research, the sound, aroma, and temperature can influence product interaction, buying decisions, and dwell time (King). Multisensory technologies can make in-store experiences more fun and engaging, such as how Nike stores have a specific fragrance that stimulates a sense of freshness among consumers, leaving an impression that can further help them differentiate between brands. Like scent diffusers that use product-associated aromas for better product display, aroma diffusion triggers

consumers to feel specific emotions and associate them with products by emitting a targeted fragrance (King).

Employing smart packaging and interactive displays in packaging can help consumers experience information in a very entertaining way and help them compare brands or products. For example, NFC tags and QR codes take consumers to portals where they can access additional information and product details. AR overlays also offer virtual try-on opportunities to consumers, while Haptic elements and haptic feedback using touchscreens give them a highly interactive and tactile experience (King).

Stronger brand recognition can be achieved through a cohesive brand experience using the same visual elements, soundscapes, or fragrances across all marketing channels (King). These technologies empower customers to make well-informed purchase decisions and push them to proceed to the next stage of purchasing.

Post-Purchase Interaction

Brands are essential in the post-purchase stage, where they can influence brand loyalty or repurchase behavior. Brands aim to create long-term consumer relationships, developing loyalty programs to communicate with consumers constantly and offering them incentives to repurchase. Brands promote consumer retention and boost lifetime value by inducing loyal consumers with discounts, rewards, or exclusive deals (Velasco and Spence).

Brands often use educational content, such as digital guides, instruction manuals, tips, FAQs, or tutorials, to provide knowledge about the product and its usage

or applications. For instance, McDonald's in Sweden launched Happy Goggles for children, which informed youngsters about the brand and its product in a fun, immersive learning experience through in-built VR goggles (Whitten).

Embedded interactive displays in innovative packaging are another fantastic way to ensure a great post-purchase experience. Consumers have access to all the information related to the product, brand, and point of contact when addressing any product-related concerns. Moreover, packaging can be repurposed by employing AR, which elevates brand engagement experiences and fosters sustainability.

Hence, combining these two approaches makes designing an overall creative post-purchase experience a breeze for CPG brands. These technologies help consumers make educated purchase decisions and increase their chances of repeat purchases (Velasco and Spence). Hence, this not only advances the consumer retention rate and brand loyalty for brands but also intensifies the brand-consumer relationship by boosting product satisfaction and trust.

Analysis of Consumer Behavior

Multi-sensory technologies can easily influence the consumer decision-making process as they have the power to create experiences that captivate multiple senses. These technologies allow packaging design to trigger emotions and foster a strong relationship with consumers (Hamilton and Price 190). For instance, VR transforms the environment into a virtual world through ideal lighting, sound, and, to some extent, even haptics and scents. This capability of VR can compel consumers to sense a set of emotions based on how brands want them to feel. It further makes it easier for brands to improve overall consumer engagement, increasing consumer acquisition and retention

rates. Consumer attention can not only be captured, but the duration of that can also extend along with increased interest (Hamilton and Price 190).

Brands can use these technologies to analyze consumers' emotional responses and engagement levels, for instance, by tracking their engagement with AR social media filters or using survey or facial recognition software data. CPG brands or their marketing team can use the collected data to modify sensory stimuli to design unique and unforgettable experiences that personally resonate with each consumer (Hamilton and Price 189).

Brands create customized and enriched packaging designs as they use the consumer insights provided by these technologies. More information about consumer preferences, buying habits, and market demand could be easily noted and accessed through these technologies. Thus, not only will the brand's packaging designs be elevated, but so will their marketing plans, which will ultimately help companies achieve their goals and offer their customers focused and customized marketing campaigns. The multi-sensory experiences grab attention and foster stronger brand-consumer relationships, achieving brand loyalty and long-term business success goals.

Evolution of CPG Packaging and Ethical Issues

As revealed by the data collection, the most influential factor making consumers worry is their data privacy. While multi-sensory experiences support CPG marketing so much, data privacy and user content must be considered to remain ethical and righteous.

Today, consumer data can be easily accessed and extracted through websites, software applications, social media, and many other platforms. It has become effortless

to keep misusers of data, which increases the chances of data leaks. So, today's consumers have become highly anxious about their data usage, safety, and the control brands have over their personal information. Therefore, organizations should be transparent and sensitive regarding the data collected and used.

Consumers are aware of data mishandling and desire active autonomy over their information. Certain multi-sensory technologies related to the products, which include smart packaging or even AR, will have features enabled for personalized recommendations and location tracking, as suggested by Morey. The felt need is to have the power to opt out or opt-in for the control of data and what all and how much of the information is shared. Our thesis survey (Appendix 1) reveals that over 30% of the respondents are uncomfortable with data collection. In comparison, 33% would like to know for what purpose the data is being used before giving a nod. Therefore, only 36% were comfortable enough with the collection if it was meant to develop a product. It is evidence that consumers wish to share their much-sought data only in positive utilization and benefits cases.

It could be complemented by multi-sensory technologies, product information, convenience, and personalized experiences. Consequently, the advantage of experiencing multi-sensory technology is what they believe to trade with their data. However, they expect a transparent data collection purpose that is relevant to the multi-sensory experience. So, to successfully gain consumer trust and a long-standing relationship with the brand, CPG marketers should refrain from sharing data or selling it to third parties.

Consumer Consent and Data Security

Sensorial experience designers should consider the following options while integrating technology into the experience: Most of these multi-sensory design technologies' heavy dependence on data gathering has raised consumer concerns regarding their consent and data privacy.

Transparency and user control: When engaging with interactive multi-sensory packaging experience or AR/VR technology, consumers want to know the kind of data collected and how and where it will be used. Brands should indicate what, when, and how they collect user data and present their opt-in and opt-out choices (Porter).

Data security and its encryption: Information from multi-sensory technology should be stored to avoid unauthorized access. Brands must adopt strong security measures, including encryption protocols, to protect consumer privacy (Smith).

Limitations of Data Collection: Access should be granted only to the data essential for a specific activity. Brands should only collect consumer information relevant to the provided sensory experience (Porter).

Brands should prioritize consumer consent and data privacy when using multi-sensory technologies, as this will significantly impact brand-consumer relationships based on reliability and trust.

Designing with Accessibility

All users, irrespective of their potential, should be able to access a multi-sensory experience. Designers can consider the following methods when designing for inclusivity.

Accessibility factors for AR/VR: VR experiences should offer new methods of working for visually impaired users, while AR should have the consistent maintenance of screen reader technology and mechanical invisibility in mind.

Sensory management: Some customers might be sensitive to particular lights, sounds, or smells. Companies should provide various possibilities for multi-sensory content and new modes of access to information.

Multicultural theory: Considering the effect of cultural perceptions and preferences in multi-sensory experiences, the design must consider different contexts carefully.

Manufacturers can focus on access strategies to guarantee the number of people benefiting from these multi-sensory technologies and avoid excluding certain groups.

Reducing Sensory Overload and Negative Brand Perception

Where multi-sensory experiences can certainly be desirable, overstimulation has a repelling effect on the customers. There are several ways to evade emotional overwhelm when designing sensorial experiences.

Balancing the senses: A well-developed multi-sensory experience should strike a steady balance between the stimuli. When one emotion is overused regarding another, this may cause an imbalance and overload on the senses, which in turn causes brand illusions.

User control and exit strategies: Consumers should be able to control the emotional stimulation they are subjected to at any given time. Explicit ways of releasing specific elements—like sounds or smells—enable users to personalize their experiences and avoid overload.

Putting user experience first: The ultimate objective of any multi-sensory experience is to enhance it by creating an instinctive, pleasurable design that adds value to the product.

Designers can prioritize the balance of sensory content with users so that brands can guarantee that multisensory technology is a positive and profitable CPG experience in today's era.

The Future of Packaging

Driven by innovation and coalescing multi-sensory technologies with sustainable practices, the future of CPG holds excellent promise. Here are some exciting possibilities:

Bioprinting for sustainable personal packaging: Bioprinting technology enables sustainable packaging with biodegradable materials like cellulose, algae, and many more. It might change the industry's environmental impact. Furthermore, bioprinting can be a step towards personalized packaging solutions, enabling brands to tailor details like the consumer's name and information about the product.

Smart packaging incorporating sensors and feedback systems: Interacting with the consumer and the product. For instance, sensor-enabled packaging can estimate product freshness by maintaining temperature for a longer shelf life. It could also include tactile information in packages that notify consumers when a product is close to expiring.

Supply chain transparency and blockchain technology combined with smart packaging: From field to shelves, smart packaging uses built-in sensors that can carry data about a product's whereabouts and be shared in real time. The technology used in

packaging helps consumers make well-informed purchase decisions by providing data about supply chain transparency.

In addition to strengthening functionality, CPG packaging of the future will create captivating and immersive experiences for the customer. CPG firms can cultivate consumer trust and environmental responsibility by fully utilizing the potential of multi-sensory technology and adopting sustainable practices. It will make the industry's future more thoughtful but exciting. CPG packaging has a bright future thanks to sustainable practices and multimodal technologies.

Sustainable personal packaging with bioprinting: Bioprinting technology makes it possible to create packaging out of biodegradable, sustainable materials like algae or cellulose. It could change how the industry affects the environment. Additionally, bioprinting can open the door for customized packaging options, enabling companies to add the customer's name or nutritional data to the container.

Smart packaging with integrated sensors and feedback mechanisms: Imagine smart packaging that provides information and interacts with the product. For example, packaging with sensors can monitor product freshness and adjust temperatures for better shelf life. Additionally, tactile information can be incorporated into the packaging to alert consumers when a product is about to expire.

Gamified packages and printed and electronic gadgets can be combined through communication to promote interaction and conversation within the skip.

Blockchain technology, creative packaging, and supply chain transparency: From shelves to the field, information about the product's journey can be provided in real time through smart packaging. Consumers can make well-informed purchase decisions by

tracking the whereabouts and even the products' origin through sensors and blockchain technology.

The future of packaging design for the CPG business extends beyond functionality since target audiences will increasingly seek an engaging and all-encompassing sensory experience. When CPG companies implement multimodal technology and sustainable practices, they can promote environmental responsibility, boost consumer trust, and create a more exciting future for the industry.

Conclusion

The thesis has explored the capability of multi-sensory technologies, when integrated into packaging design, to enhance in-store consumer experiences. The research investigated the evolution and the rising demand for sensorial branding and design and found ways to integrate these multi-sensorial elements into CPG packaging designs. The existing literature and future applications have identified the ability of sensory elements in packaging design. The study proves that sight, sound, smell, touch, and other sensory cues deeply impact consumers' in-store shopping behavior and purchase decisions. These sensory cues allow brands to create an interactive and memorable multi-sensory experience through packaging design.

The study also analyzed the opportunities and benefits of integrating innovative packaging. Innovations like fragrance diffusers, tactile feedback on products through QR codes, 360 degrees of virtual reality experience, and gamification can delight the target audience. It also helps brands understand their target market better through the information provided by these technologies as they update consumers about product details in an engaging manner.

AR overlays, tactile feedback, and touchscreen displays can elevate in-store experiences, allowing consumers to interact with brands. The research also concluded that integrating sensorial experiences in packaging can trigger various emotions among target audiences throughout their online and offline consumer journey and, ultimately, build deeper brand-consumer relationships while fortifying brand identity and recognition.

- Ethical considerations: Data privacy considerations involving the collection of user data via interactive packaging and displays are best served by transparency in practices and Immaculate processes of user consent.
- Accessibility: Inclusive experiences should be designed to meet different needs and abilities of consumers, such as visually and auditorily competent, in order not to alienate any segments of the consumer base.
- Emotional overwhelm: Depending too much on emotional cues can have the potential to result in an overload, resulting in negative brand perceptions; a balance has to be sought with involvement for user control.

Through smart integration, bioprinting, and other upcoming technologies, the future of packaging design can be embarked on with exciting possibilities for CPG brands. Due to the rising sustainability awareness and movements, biodegradable packaging solutions are noticing a rising demand among eco-conscious consumers. Technologies that offer features like freshness indicators or active temperature will be in

high demand and would be good alternatives to include in packaging design for enhancing the consumer experience.

Technology and design, converging with consumer behavior, birth a uniquely sweet spot of opportunity for CPG companies to upgrade the in-store experience. Retailers can develop a better immersive, engaging, and memorable packaging experience through smart packaging with a centralized focus on emotional branding.

Nevertheless, companies should be aware of ethical and practical issues and consider ways to combat these challenges of accessibility, data security, and privacy. The thesis establishes the groundwork for future explorations of ways in-store experiences can be improved through the usage of sensory design and the latest technologies. Moreover, the ethical considerations and ever-evolving practices of data privacy will need constant monitoring and adaptation as the usage of this technology increases.

Appendix A: Questionnaire

Figure 1: Age of respondents.....	42
Figure 2: Gender of respondents.....	42
Figure 3: Location of respondents.....	43
Figure 4: Respondent's shopping channel preference.....	43
Figure 5: Respondent's frequency of shopping.....	44
Figure 6: Packaging influence on respondent's purchase decisions.....	44
Figure 7: Importance of sensory components in packaging.....	45
Figure 8: Respondent's consumer purchase factors	45
Figure 9: Respondent's awareness of CPG packaging tech.....	46
Figure 10: Respondent's interest in multi-sensory CPG features.....	46
Figure 11: Data privacy preferences of respondents.....	47
Figure 12: Respondent's perception of user benefits of multi-sensory tech.....	47
Figure 13: Respondent's concerns about using multi-sensory technologies.....	48

Age
114 responses

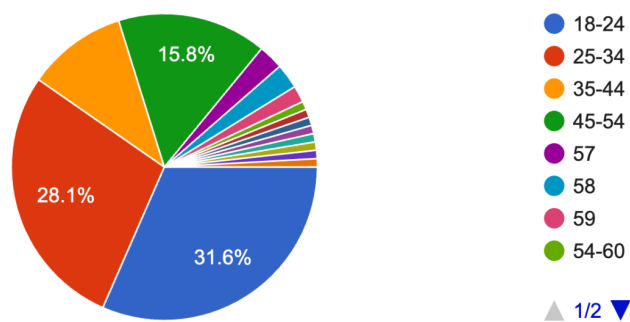


Fig. 1. Age of respondents

Gender
114 responses

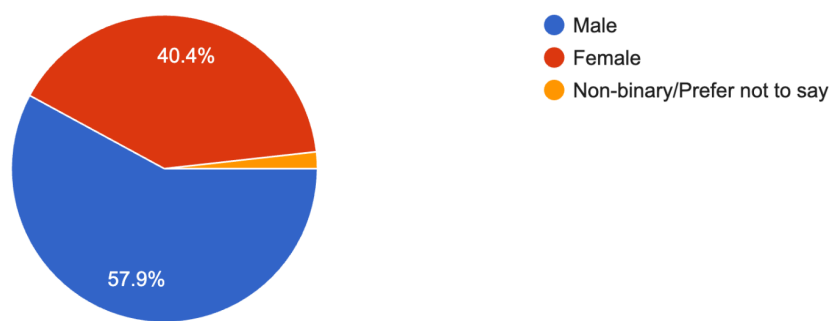


Fig. 2. Gender of respondents

Do you live in the US?

113 responses

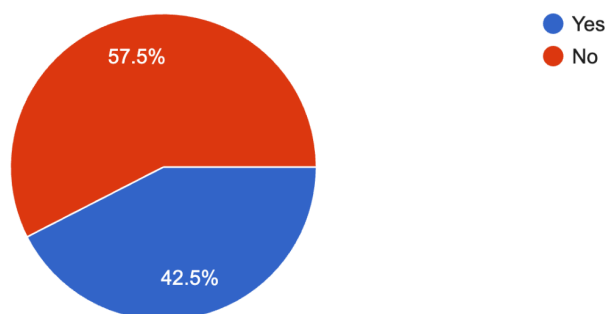


Fig. 3. Location of respondents

Which one do you prefer to shop for everyday products?

113 responses

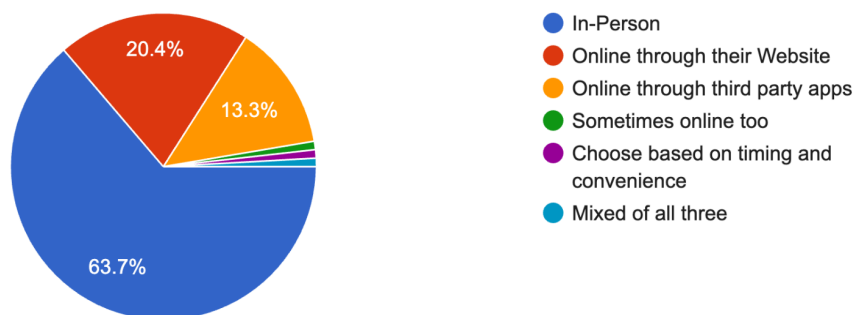


Fig. 4. Respondent's shopping channel preference

How often do you go to grocery store in person/online?

113 responses

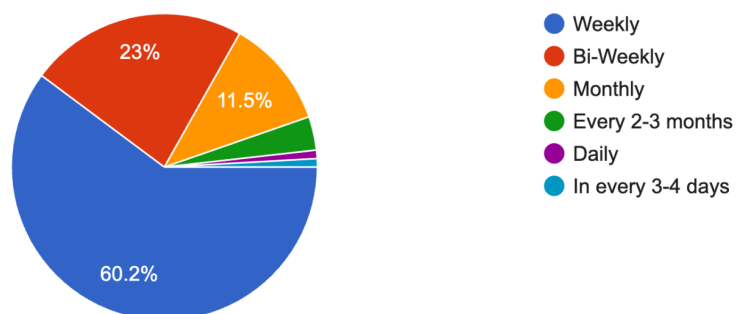


Fig. 5. Respondent's frequency of shopping

How often does your purchase decision depend on product packaging?

114 responses

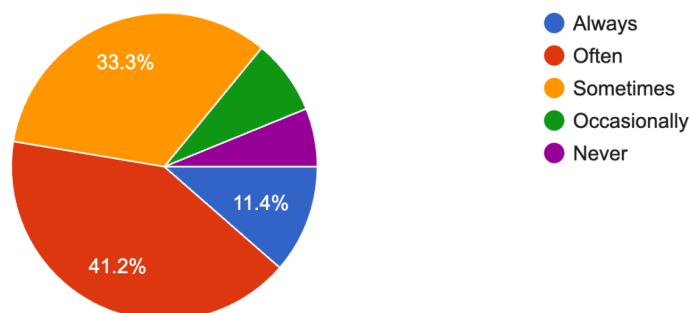


Fig. 6. Packaging influence on respondent's purchase decisions

How important do you think the following sensory components are in the design of CPG packaging?
(Please rank from Not Important to Very Important using the provided scale.)

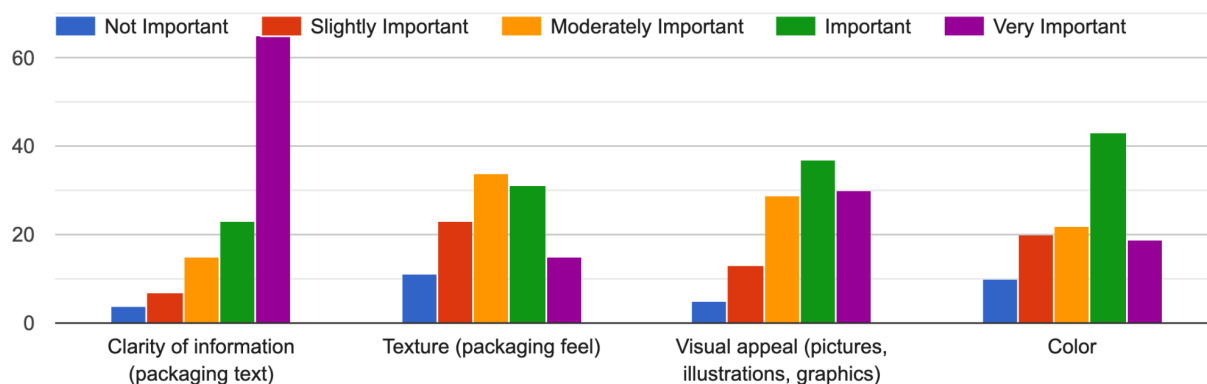


Fig. 7. Importance of sensory components in packaging for respondent's

How important a role do the following considerations play in your decision to purchase a CPG product? (Please rank from Not Important to Very Important using the provided scale.)

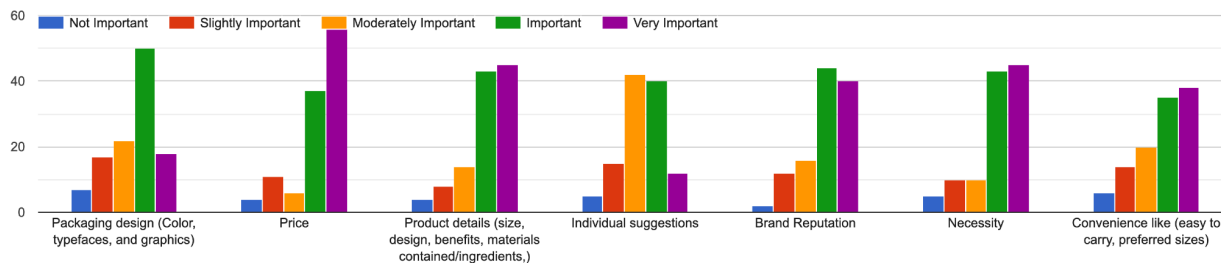


Fig. 8. Respondent's consumer purchase factors

Are you aware of any of the following technologies utilized in CPG packaging? Please check all that apply.

114 responses

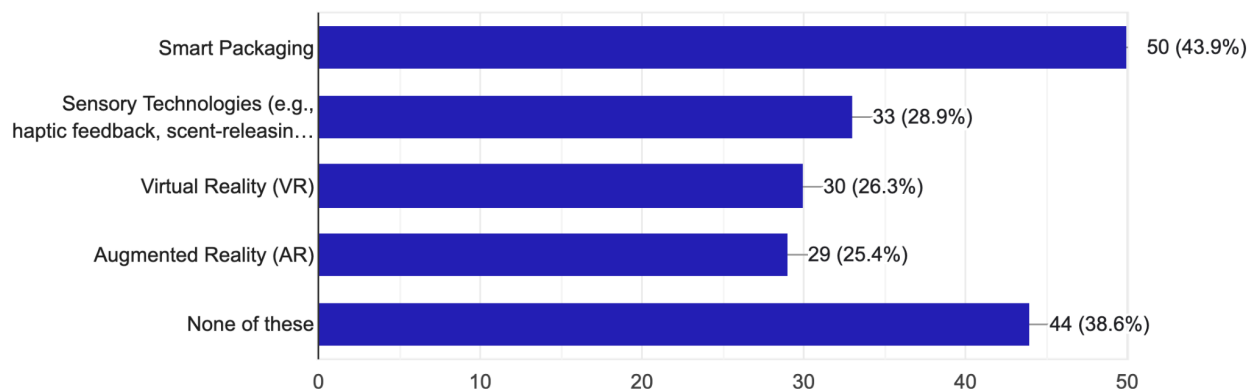


Fig. 9. Respondent's awareness of CPG packaging tech

How likely are you to be interested in purchasing a CPG product that makes use of one or more of these multi-sensory technologies, given these possibilities at All to Very Likely using the provided scale.)

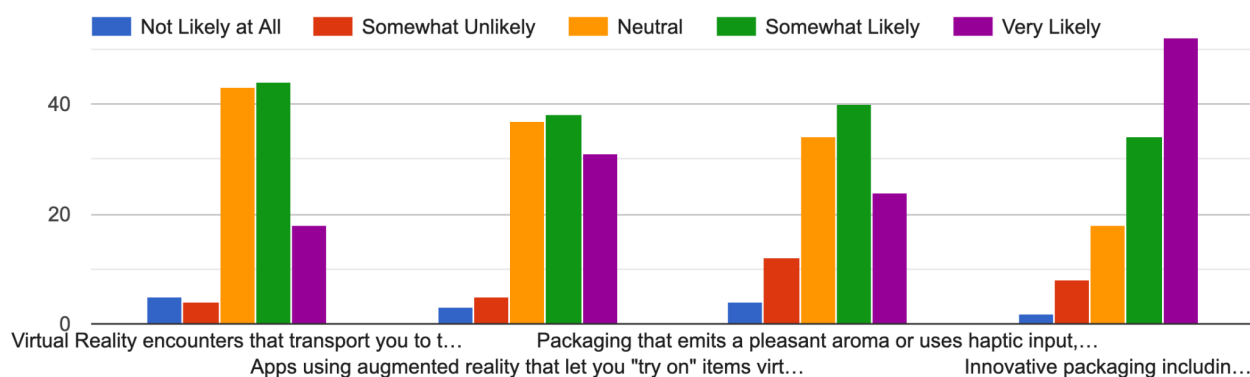


Fig. 10. Respondent's interest in multi-sensory CPG features

Would you feel comfortable knowing that CPG companies are gathering information about your interactions with their products via Augmented Reality (AR) or smart packaging? (Pick one)

114 responses

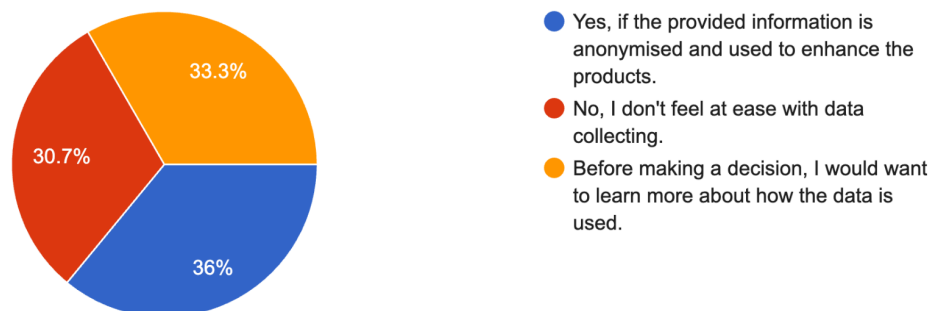


Fig. 11. Data privacy preferences of respondents

How do you think emerging multi-sensory technologies can improve your overall experience with CPG products? (Choose all that apply)

114 responses

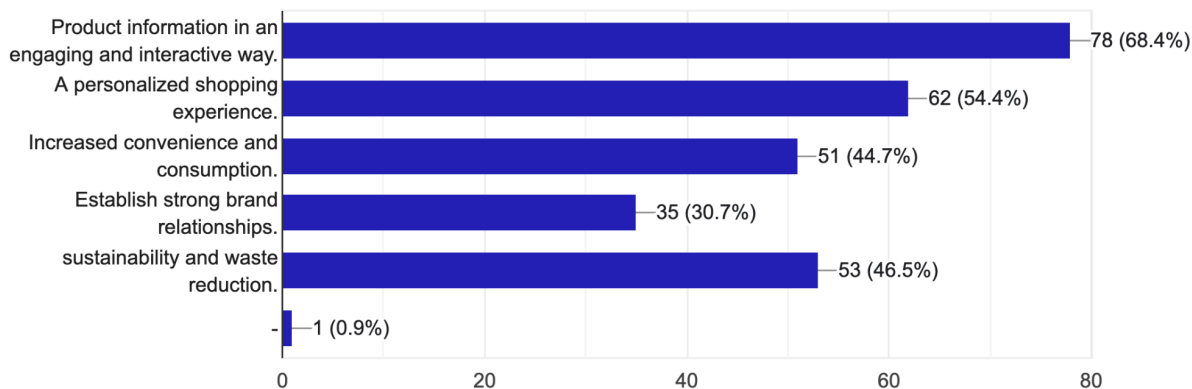


Fig. 12. Respondent's perception of user benefits of multi-sensory tech

Do you have any concerns or possible drawbacks about using these technologies in CPG packaging?

45 responses

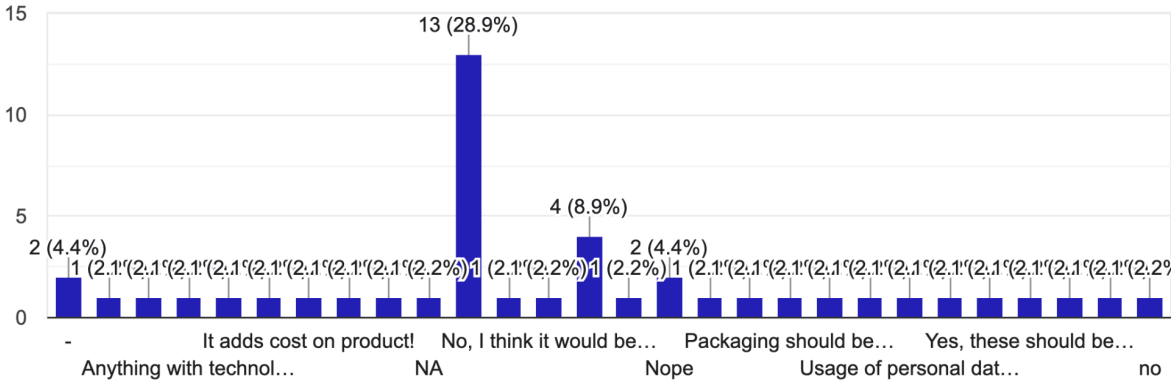


Fig. 13. Respondent's concerns about using multi-sensory technologies

Appendix B: Visual Design

Figure 1: About the brand.....50

Figure 2: Brand's product line extension.....50

Figure 3: Current market challenges.....51

Figure 4: Strategy.....51

Figure 5: Personas.....52

Figure 6: Packaging Design Mockup 1.....52

Figure 7: Packaging Design Mockup 2.....53

Figure 8: Packaging Design Mockup 3.....53

Figure 9: Packaging Design Mockup 4.....54

Figure 10: Packaging Design Mockup 5.....54

Figure 11: AR Experience Snapshots.....55



Fig. 1. About the brand

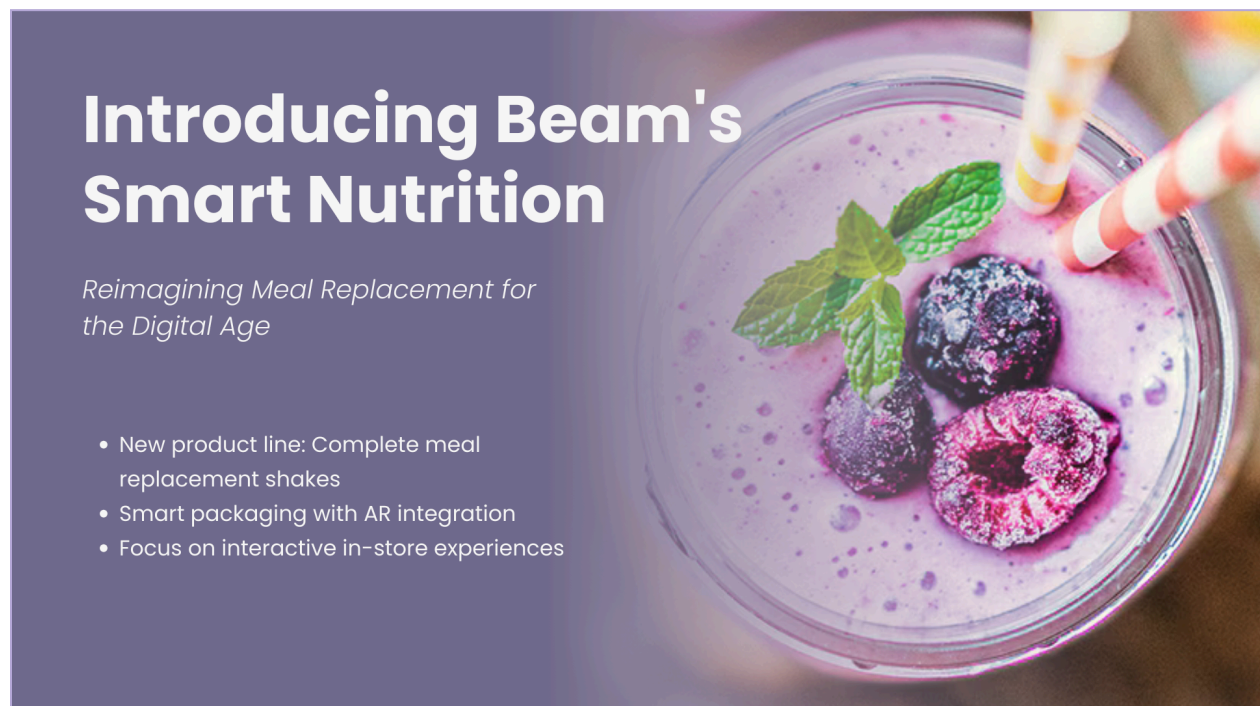


Fig. 2. Brand's product line extension



Fig. 3. Current market challenges



Fig. 4. Strategy

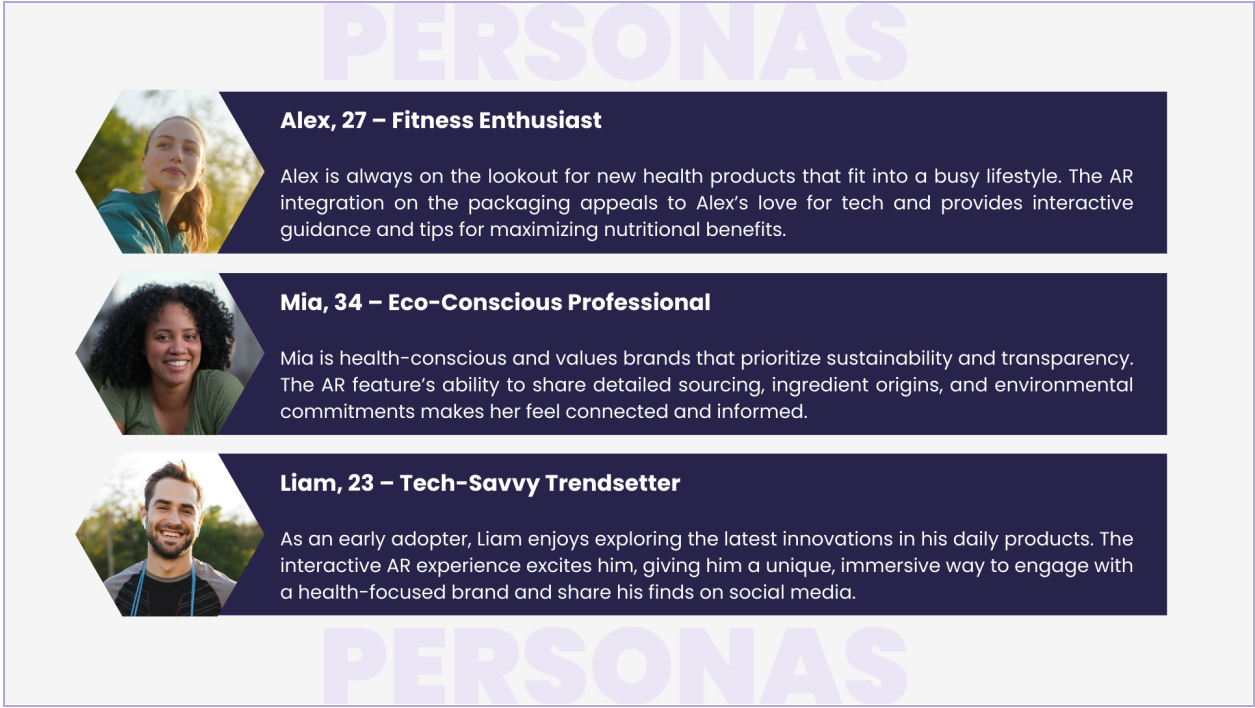


Fig. 5. Personas



Fig. 6. Packaging Design Mockup 1



Fig. 7. Packaging Design Mockup 2



Fig. 8. Packaging Design Mockup 3



Fig. 9. Packaging Design Mockup 4



Fig. 10. Packaging Design Mockup 5

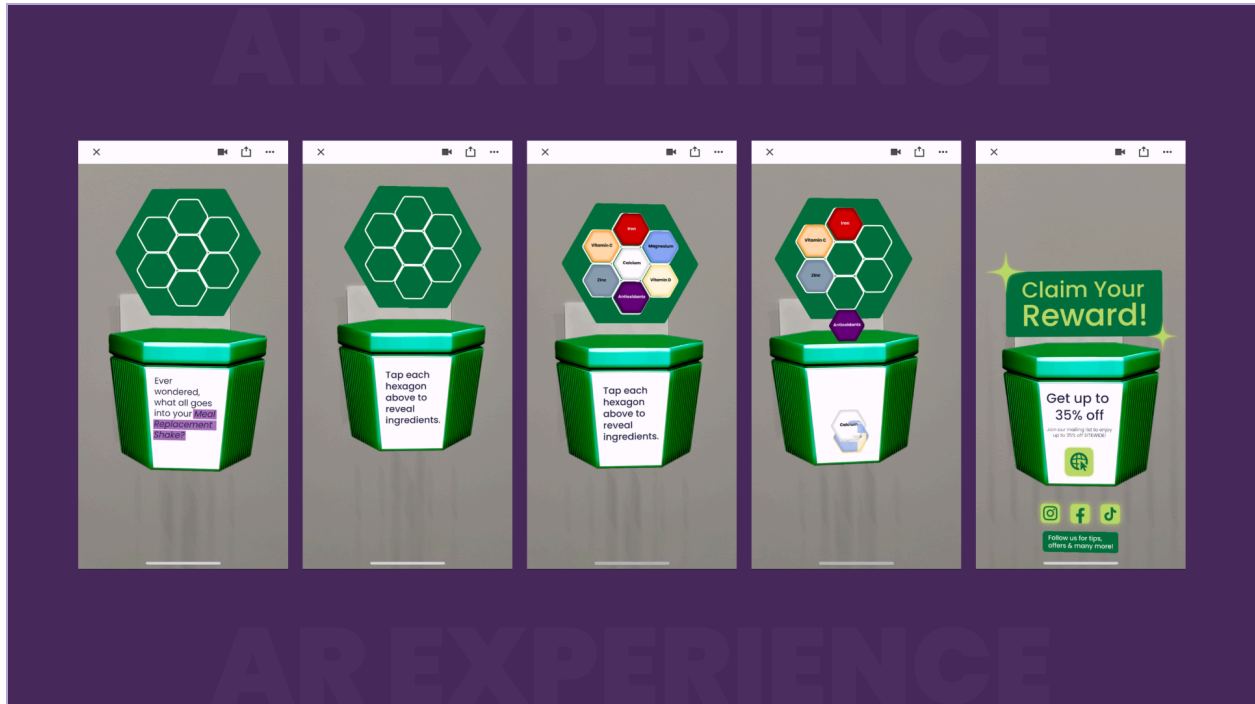


Fig. 11. AR Experience Snapshots

Works Cited

Akhzar, Phillip. "Smart Packaging: A Revolution in Packaging Technology." Arka, 13

Oct. 2023,

www.arka.com/pages/smart-packaging. Accessed 24 May 2024.

Alexander, Amara. "5 Standout CPG Sustainability Packaging Efforts." *Consumer*

Goods Technology, 11 July 2023,

consumergoods.com/5-standout-cpg-sustainability-packaging-efforts. Accessed

29 May 2024.

Alsop, Thomas. "Investment in augmented and virtual reality (AR/VR) technology

worldwide in 2024, by use case." *Statista*, 6 Sept. 2022,

www.statista.com/statistics/1098345/worldwide-ar-vr-investment-use-case.

Accessed 24 May 2024.

"AR & VR - Worldwide." *Statista*, April 2024

www.statista.com/outlook/amo/ar-vr/worldwide. Accessed 29 May 2024.

Arora, Nidhi, et al. "The Value of Getting Personalization Right—or Wrong—is

Multiplying." McKinsey & Company, 12 Nov. 2021,

[www.mckinsey.com/capabilities/growth-marketing-and-sales/our-insights/the-value](https://www.mckinsey.com/capabilities/growth-marketing-and-sales/our-insights/the-value-of-getting-personalization-right-or-wrong-is-multiplying)

[of-getting-personalization-right-or-wrong-is-multiplying](https://www.mckinsey.com/capabilities/growth-marketing-and-sales/our-insights/the-value-of-getting-personalization-right-or-wrong-is-multiplying). Accessed 26 May

2024.

"Augmented Reality and NFC: Bridging the Physical-Digital Gap." *Medium*, 2 Oct. 2023,

[medium.com/@davidharris00017/augmented-reality-and-nfc-bridging-the-physical](https://medium.com/@davidharris00017/augmented-reality-and-nfc-bridging-the-physical-digital-gap-b6485923de52)

[digital-gap-b6485923de52](https://medium.com/@davidharris00017/augmented-reality-and-nfc-bridging-the-physical-digital-gap-b6485923de52). Accessed 29 May 2024.

Bottinelli, Stef, and Brita Lapatza. "The History of Food Packaging: How Packaging

Design Has Changed Through the Years.” *Food Matters Live*, 18 Aug. 2023, foodmatterslive.com/article/the-history-of-food-packaging-how-packaging-design-Has-changed-through-the-years. Accessed 29 May 2024.

Burley, James. “The Future of CPG: How Technology Is Transforming the Industry.” *Retail Technology Review*, 29 July 2023, www.retailtechnologyreview.com/articles/2023/07/29/the-future-of-cpg-how-technology-is-transforming-the-industry. Accessed 29 May 2024.

Clark, Nikki. “How Food Packaging Color Influences Consumer Behavior.” HART Design & Manufacturing, Inc., 12 Apr. 2016, hartdesign.com/industry-news/food-packaging-color-influences-consumer-behavior/. Accessed 29 May 2024.

“Color Trends Happening Right Now in Product Packaging.” Combined Technologies Inc., 17 Apr. 2022, www.ctipack.com/color-trends-product-packaging. Accessed 29 May 2024.

“Consumer Packaged Goods (CPG) Market Size to Hit USD 3,171.11 Bn by 2032.” *GlobeNewswire News Room*, Precedence Research, 6 Mar. 2024, www.globenewswire.com/news-release/2024/03/06/2841623/0/en/Consumer-Packaged-Goods-CPG-Market-Size-to-Hit-USD-3-171-11-Bn-by-2032.html. Accessed 26 May 2024.

“Consumer Packaged Goods (CPG) Market Is Set to See Revolutionary Growth in Decade.” LinkedIn, 11 Dec. 2023, www.linkedin.com/pulse/consumer-packaged-goods-cpg-market-set-see-revolutionary-growth-in-decade/. Accessed 29 May 2024.

Cosgrove, Joanna. "Capturing the Shiny Allure of Luxe." *Beauty Packaging*, 26 Apr.

2023,

www.beautypackaging.com/issues/2023-04-01/view_features/capturing-the-shiny-allure-of-luxe. Accessed 29 May 2024.

"CPG industry advertising and marketing in the U.S." *Statista*, 2023

www.statista.com/study/62098/cpg-industry-advertising-in-the-us. Accessed 29 May 2024.

Daggar, Jay. "Packaging Colour Psychology - How It Affects Your Success." GWP

Group, 16 Feb. 2024, www.gwp.co.uk/guides/packaging-colour-psychology/. Accessed 29 May 2024.

Faria, Ricardo. "The Impact of Sensory Design on User Engagement and Satisfaction."

Medium, 26 Apr. 2023,

<https://medium.com/@faria.faria9/the-impact-of-sensory-design-on-user-engagement-and-satisfaction-fdf203409701>. Accessed 29 May 2024.

Floyd, Andrea. *How Does Color in Package Design Lead to Emotional Appeal and*

Consumer Behavior? 2011. Coastal Carolina University, Bachelor's Thesis.

digitalcommons.coastal.edu/honors-theses/121/?utm_source=digitalcommons.coastal.edu%2Fhonors-theses%2F121&utm_medium=PDF&utm_campaign=PDFCoverPages. Accessed 8 Nov. 2024.

Fofana, Oumar. "Packaging's crucial role in consumer decision-making." *Packaging*

Gateway, 15 Dec. 2023,

www.packaging-gateway.com/features/packagings-role-consumer-decision-making/?cf-view. Accessed 29 May 2024.

- Goodman, Lizzie. "Nestle Launches Augmented Reality Cereal Boxes." *Marketing Week*, 18 Oct. 2014,
www.marketingweek.com/nestle-launches-augmented-reality-cereal-boxes.
 Accessed 26 May 2024.
- Gordon, Nicola. "The Importance of Colour When Designing Sensory Rooms." *Sensory Technology*, 8 Nov. 2022,
www.senteq.co.uk/the-importance-of-colour-in-sensory-rooms/. Accessed 24 May 2024.
- "Gucci's Sustainable Packaging – Gucci Equilibrium." Gucci Equilibrium, 13 Nov. 2020,
equilibrium.gucci.com/guccis-sustainable-packaging/. Accessed 29 May 2024.
- Guerrero, Oscar. "Top CPG Companies of 2024: Who Leads the Market?" *Orders In Seconds*, 29 Apr. 2024,
ordersinseconds.com/top-cpg-companies-of-2024-who-leads-the-market.
 Accessed 29 May 2024.
- Hamilton, Rebecca, and Linda L. Price. "Consumer Journeys: Developing Consumer-based Strategy." *Journal of the Academy of Marketing Science*, vol. 47, no. 2, 2019, pp. 187–191.
<https://doi.org/10.1007/s11747-019-00636-y>. Accessed 29 May 2024.
- Jiang, Yongli, et al. "Latest Advances in Active Materials for Food Packaging and Their Application." *Foods*, vol. 12, no. 22, Multidisciplinary Digital Publishing Institute, 7 Nov. 2023, pp. 1-4.
<https://doi.org/10.3390/foods12224055>. Accessed 3 Jan. 2024.
- Johnson, Bobby. "The Digital Transformation of the CPG Industry." *Inspira Marketing*, 8

- Sept. 2021,
inspiramarketing.com/the-digital-transformation-of-the-cpg-industry/. Accessed 8
Nov. 2024.
- Karangi, Sheena W., and Ben Lowe. "Haptics and brands: the Effect of Touch on
Product Evaluation of Branded Products." *Journal of Consumer Behaviour*, vol.
20, no. 6, 15 June 2021,
<https://doi.org/10.1002/cb.1959>. Accessed 26 May 2024.
- Kenny, Jack. "Color and Packaging." *Label and Narrow Web*, 12 Oct. 2018,
[www.labelandnarrowweb.com/issues/2018-10/view_front_row/color-and-packagi](http://www.labelandnarrowweb.com/issues/2018-10/view_front_row/color-and-packaging)
Ng. Accessed 29 May 2024.
- King, Scott. "Multisensory Retail Experiences: Touch, Taste, and Smell Through Your
Eyes and Ears." LinkedIn, 31 Oct. 2022,
www.linkedin.com/pulse/multisensory-retail-experiences-touch-taste-smell-throug
H-scott-king. Accessed 29 May 2024.
- Krishna, Aradhna, et al. "Sensory Aspects of Package Design." *Journal of Retailing*, vol.
93, no. 1, Science Direct, Mar. 2017, pp. 43–54.
<https://doi.org/10.1016/j.jretai.2016.12.002>. Accessed 29 May 2024.
- Menhorn, Jack. "Audio Branding in Coca-Cola Advertising." *Designing Sound*, 18 Oct.
2015,
designingsound.org/2015/10/18/audio-branding-at-world-of-coke. Accessed 24
May 2024.
- Morey, Timothy, et al. "Customer Data: Designing for Transparency and Trust." *Harvard
Business Review*, May 2015,

hbr.org/2015/05/customer-data-designing-for-transparency-and-trust. Accessed 24 May 2024.

“Multisensory Packaging Design Increases Brand Loyalty, Shelf Impact.” *Packaging Digest*, 19 Oct. 2023,
www.packagingdigest.com/packaging-design/multisensory-packaging-design-increases-brand-loyalty-shelf-impact. Accessed 24 May 2024.

“Multisensory Packaging – 20 of Our Favorites.” Greatergood, 7 Mar. 2024,
greatergood-brands.com/multisensory-packaging-20-of-our-favourites. Accessed 24 May 2024.

Mzizi, Yola. “L’Oréal Is Trying to Bring Virtual Try-On for Hair Colour to the Masses.” *The Business of Fashion*, 22 May 2024,
www.businessoffashion.com/articles/technology/loreal-is-trying-to-bring-virtual-try-on-for-hair-colour-to-the-masses-snapchat-walmart. Accessed 29 May 2024.

“Nescafé Teams up with Google to Offer First Virtual Reality Coffee Experience.” Nestlé Global, 29 Sept. 2015,
www.nestle.com/media/news/nescafe-google-virtual-reality-coffee-experience. Accessed 29 May 2024.

Niv, Gil, and David Harris. “Most Americans Say That the Design of a Product’s Packaging Often Influences Their Purchase Decisions.” *Ipsos*, 3 May 2018,
www.ipsos.com/en-us/news-polls/Most-Americans-Say-That-the-Design-of-a-Products-Packaging-Often-Influences-Their-Purchase-Decisions. Accessed 25 Oct. 2019.

Nyagucha, Mainye Assumpter. *Impact of Social Media on Consumer’s Decision Making*

- Process among the Youth in Nairobi*. 2017, erepo.usiu.ac.ke/handle/11732/3282. Accessed 29 May 2024.
- Oloyede, Omobolanle O., and Stella Lignou. "Sustainable Paper-Based Packaging: A Consumer's Perspective." *Foods*, vol. 10, no. 5, May 2021, <https://doi.org/10.3390/foods10051035>. NCBI. Accessed 24 May 2024.
- Overstreet, Kim. "Augmented Reality Packaging Innovations for CPGs, Beer and Wine Industry." *Packaging World*, 12 Apr. 2021, www.packworld.com/design/package-design/article/21366853/augmented-reality-Packaging-innovations-for-cpgs-beer-and-wine-industry. Accessed 29 May 2024.
- "Packaging with Scents." *Interpack Spotlight Magazine*, 11 Sept. 2018, www.interpack.com/en/Media_News/SPOTLIGHT_Magazine/COSMETICS_PACKAGING/Cosmetics_Industry_News/Packaging_with_Scents. Accessed 29 May 2024.
- Peralta, Ari, and Arigami. "Sensory Enabling Technologies Are Radically Reshaping the Future of Digital Retail." *Retail TouchPoints*, 7 June 2023, www.retailtouchpoints.com/topics/retail-innovation/sensory-enabling-technologies-digital-retail. Accessed 29 May 2024.
- Pittilla, Mary Jane. "Heineken Chills Out With Innovative Packaging Designs." *Moodie Davitt Report*, 22 Jan. 2024, moodiedavittreport.com/heineken-chills-out-with-innovative-packaging-designs. Accessed 29 May 2024.
- Porter, Alexis. "Opt-in vs Opt-Out: Understanding Consent Management." *BigID*, 24 July 2024,

bigid.com/blog/opt-in-vs-opt-out-consent/. Accessed 30 Oct 2024.

Shabgou, Mojtaba, and Shahram Mirzaei Daryani. "Towards the Sensory Marketing: Stimulating the Five Senses (Sight, Hearing, Smell, Touch and Taste) and Its Impact on Consumer Behavior." *Semantic Scholar*, 2014, www.semanticscholar.org/paper/TOWARDS-THE-SENSORY-MARKETING%3A-STIMULATING-THE-FIVE-Shabgou-Daryani/9073ba4c8c1b79696a287dfc0c035ba5c8b173d4. Accessed 24 May 2024.

Silva, Paula. "Virtual Reality on Wine Tasting." *Science and Wine*, 22 Mar. 2020, www.ciencia-e-vinho.com/2020/03/22/virtual-reality-on-wine-tasting. Accessed 29 May 2024.

Skeldon, Paul. "Half of Consumers Would Choose AR to Augment Retail Experience and Build Loyalty." *Internet Retailing*, 2 Nov. 2022, internetretailing.net/half-of-consumers-would-choose-ar-to-augment-retail-experience-and-build-loyalty/. Accessed 26 May 2024.

Smith, Anthony. "How to Ensure Data Security for Your Customers." *Forbes*, 25 Jan. 2024, www.forbes.com/councils/forbesbusinesscouncil/2024/01/25/how-to-ensure-data-security-for-your-customers/. Accessed 29 May 2024.

Spence, C. *Multisensory Packaging Design*. Woodhead Publishing, 2016. <https://doi.org/10.1016/b978-0-08-100356-5.00001-2>. Accessed 24 May 2024.

"The Power of Sound: How Brands Use Music and Sound Effects to Influence Consumer Behavior." LinkedIn, 31 Mar. 2023, <https://www.linkedin.com/pulse/power-sound-how-brands-use-music-effects-influ>

ence-consumer/. Accessed 26 May 2024.

Velasco, Carlos, and Charles Spence. *Multisensory Packaging: Designing New Product Experiences*. Cham Springer International Publishing, 2019.

link.springer.com/book/10.1007/978-3-319-94977-2. Accessed 29 May 2024.

Whitten, Sarah. "McDonald's turns some Happy Meals into VR goggles?" *CNBC*, 29 Feb. 2016,

www.cnbc.com/2016/02/29/mcdonalds-turns-some-happy-meals-into-vr-goggles.html. Accessed 24 May 2024.

Zelios, Sam. "Can The Texture of Your Product Packaging and Label Drive More Sales?" *Online Labels*, 27 July 2023,

www.onlinelabels.com/articles/consumer-psychology-how-product-packaging-texture-influences-purchase-decisions. Accessed 29 May 2024.