

SPECIAL FOCUS PAPER

# Tech-Driven Sensory Marketing: Integrating AR/VR, IoT, and OVR to Decode Consumer Emotions

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## ABSTRACT

The tendency to use sensory marketing in business innovation has increased exponentially with advancements in mobile and innovative technologies. The concept of sensory marketing has become widely popular among global marketers to connect with consumers emotionally. Sensory marketing employs the five fundamental senses—taste, smell, touch, vision, and sound—to provide consumers with a distinctive sensory experience. Several technologies, such as haptic technology used in smart mobile phones and olfactory virtual reality (OVR), increase the effectiveness of sensory marketing. It enhances their purchasing behavior by providing them with an effective overview of the products and offerings. Several globally popular brands are currently using this marketing strategy, which can be overwhelming without knowledge of its proper application. Hence, the connection between sensory stimulation, usage of technology, and emotional connection of brands to consumers has been explored through this study.

## KEYWORDS

sensory analytics, sensory marketing, AR/VR, olfactory virtual reality (OVR), IoT, consumer emotions, multisensory system

## 1 INTRODUCTION

Consumers often want to sense and feel products before purchasing them to improve their virtual experience. The concept of sensory marketing comes into this context and refers to a marketing technique using the five senses to create memorable experiences for customers [1]. Sensory marketing aims to impact the purchasing decisions of consumers by focusing on their emotions. This marketing technique stimulates the senses such as sight, touch, taste, sound, and smell to generate unique experiences for consumers. The objective of this paper is to demonstrate the benefits of sensory marketing that can resonate with the emotional level of global consumers. However, the field of sensory marketing is still less explored and requires more explanation [2]. Therefore, the paper will try to deliver knowledge on

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various sensory marketing technologies, such as olfactory virtual reality (OVR), to identify consumers' emotions and develop marketing strategies accordingly. Sensory marketing is less explored, or rather underutilized, due to its complex nature, cost of implementation, and lack of knowledge and expertise to properly use it [3]. These can also be seen as problematic areas to use sensory marketing effectively, which will be addressed in the current study.

## 2 THEORETICAL FRAMEWORK AND RESEARCH SCOPE

The scope of the current research relies on its selection of a less explored yet emerging technological concept of sensory marketing. Sensory marketing is believed to create a positive emotional state among consumers before their purchasing decisions [4]. The growing importance and visible innovative outcome from such a pleasing marketing technique make the current research valuable in its respective research background. The research explores marketing strategies used by a few global companies going beyond visual and auditory aspects [5]. Besides, it has been incorporated with the creation of an emotional connection with consumers to generate a deeper understanding of their preferences. Therefore, the current research is appealing and has significant scope to be further explored in the future.

### **Theoretical framework: What is the meaning of sensory marketing regarding consumer emotions?**

The Sensory Integration (SI) Theory explains that sensory information is processed in the nervous system so that an action can be taken. Occupational therapist Dr. A. Jean Ayres has developed this theory by explaining that human senses work to help in experiencing, interpreting, and responding to stimuli [3]. This theory can be applied in sensory marketing to understand sensory profiles, such as sensitivity towards sound and visual cues that can be incorporated in tailoring marketing strategies [6]. Companies can create multisensory experiences for customers by integrating sensory output, as the theory emphasizes, and in marketing, it refers to the creation of experiences engaging various senses harmoniously, as shown in Table 1.

**Table 1.** Summary of recurrent sensory marketing technologies

Sense	Common Interfaces		New Sensory-Enabled Technologies	
Touch	Touchscreen, mouse	Color psychology [7] Digital experience [8] Tactile sensation [1]	Means/cues OVR, vibro-tactile interfaces	Color psychology [9] OVR [10] Interaction [11] "Phygital" experiences [13] Emotional connection [14]
Smell	X	Flavor profiles [12]	Olfactory cues and smell inputs for a multisensory experience	
Sight	Screen: Pictures, videos, colors, icons, size, position	Color psychology [15]	Augmented Reality (AR), virtual try-on, 3D views	Tactile sensations [16] Product interactions [18] OVR [19] Emotional influence [21]
Hearing	Speaker, headphones	Phygital experience [17] Tactile sensations [20]	Auditory inputs for multisensory experiences	

Source: Compiled by authors.

Sensory marketing strategies benefit marketers by creating a better visual representation for consumers to connect with them in a better way [22]. Besides, as per

the SI theory, focusing on tactile, proprioceptive, and vestibular senses can improve social-emotional development. Thus, global marketers can focus on these senses through sensory marketing by using multisensory tools and techniques.

### 3 MATERIAL AND METHODS

A qualitative method has been applied in this study to focus on various aspects of sensory marketing. Key concepts of sensory marketing and the findings of other authors in this context have been summarized along with contributing practical applications of this marketing [20]. The qualitative method also involves in-depth analysis of different technologies, such as OVR, in impacting sensory marketing. Besides, the research summary has mentioned relevant examples of previous literature to provide a brief idea about the chosen studies.

## 4 RESULTS

### 4.1 Sensory marketing technologies: Relating customers to their emotional level

Five human senses, such as sight, hearing, taste, touch, and smell, are mainly used in sensory marketing to connect emotionally with customers. Laukkanen et al. [23] have stated that creating an emotional and memorable experience for customers can help trigger their emotions to carefully curate their sensory stimuli. Moreover, it assists in influencing the perceptions of customers to attract them to different brands and their various product offerings. On the other hand, as argued by Bhatia et al. [24], sensory marketing uses various technologies for different purposes, such as AI (artificial intelligence), VR (virtual reality), AR, Haptic technology, OVR, and the like. Thus, brands need to strategically incorporate such technologies so that they can effectively capture the emotional levels of consumers (refer to Table 2).

**Table 2.** Research summary on different concepts of sensory marketing

	Sensory Design	Relevant Literature Examples	Key Findings
Emotional connection	Color schemes	[1]	Colors are carefully used by marketers to evoke emotions among consumers; for instance, warm colors indicate comfort, and cool colors are used to evoke relaxation.
	Imagery	[2]	High-quality images help in creating emotional connections, such as the images of serene places or a happy family.
	Sound effects	[4]	Immersive experiences are created with sound effects, such as the projection of high-quality sounds in a store offering music systems.
Customer experience	Aromatherapy	[5]	A relaxing atmosphere for customers is created using aromatherapy, such as the smell of lavender in the spa store.
	Textures	[22]	Emotions can be evoked with texture, such as soft fabrics, to demonstrate a comfortable environment.
	Taste tests	[6]	Taste tests can be offered to generate immersive experiences, such as food sampling.

(Continued)

**Table 2.** Research summary on different concepts of sensory marketing (Continued)

	Sensory Design	Relevant Literature Examples	Key Findings
Emotional influence	Product pairing	[3]	Pairing products can emotionally influence consumers and attract them towards a brand, such as combining two cosmetic products.
	Smells	[24]	Smells can help in emotionally connecting with consumers, such as the smell of freshly brewed coffee in a cafe.
	Lighting	[23]	Lights are set to create an ambience to connect with consumers, such as through warm lights to create a cozy atmosphere.
Product interactions	Voiceover	[25]	Immersive experiences can be created through voice, generating a personal connection, such as a friendly voice in customer service.
	Scented packaging	[26]	Fragrance products can use scented packaging to convey the purpose of the product to its customers.
	Flavor profiles	[27]	Flavor profiles evoke emotions, such as showcasing different flavors of dessert products to provide product knowledge to its consumers.

Source: Compiled by authors.

**Consolidated color psychology.** Color psychology in marketing is considered to be an essential component, as it focuses on the impact of colors on the impressions of consumers. Brands use color theory to persuade customers so that they can consider specific brands and make purchasing decisions [26]. The visual impact of colors needs to meet strategic engagement involving multiple senses of the consumers. Color is seen as a foundation and as a first visual impression that works as a sensory element to provide a positive experience to customers. It can prime consumers in terms of receiving particular emotional responses [27]. For instance, cool tones of colors induce calmness that influences the reactions of the sensory stimuli for consumers.



**Fig. 1.** a) Color psychology in logo design, b) Color psychology used in marketing and branding  
Source: [25]; [26].

Colors often influence how the smells of a specific object are perceived; for instance, yellow-colored rooms can make the scent of a lemon more intense [25].

It is also oriented with tactile sensations, as warm-colored surfaces feel softer, while cool colors can make a surface firmer. Color manipulation also offers a dynamic canvas for brands, and colors can also be changed at different stages to match customer journeys or highlight particular product features, as projected in Figure 1.

**Consolidated flavor profiles.** The flavor profiles are multidimensional, considering tastes such as sweet, bitter, salty, sour, and umami, mouthfeel (smooth, creamy, crispy), and aroma (floral, spicy, fruity) and the respective [8]. Flavor profiling can be done by marketers using both objective and subjective assessments to offer consumers a complete overview of the products. As a result, it can connect with customers and understand their taste profiles to manufacture products.

Various technologies can be used to implement flavor profiles, such as “*Gas Chromatography-Mass Spectrometry (GC-MS)*” and “*High-Performance Liquid Chromatography (HPLC)*” [23]. The GC-MS technique helps in identifying and measuring volatile elements of aroma for an objective analysis of the scent profile of a product. On another note, the implementation of HPLC assists in analyzing the non-volatile compounds of a product, such as acidic components or sugar contributing to taste [25]. Besides, e-noses, texture analyzers, and sensory panels can also be used by marketers for personalized recommendations for consumers.

**The rise of the “Phygital” experience.** The concept of a “Phygital” consumer experience is a rising notion, a fusion of physical and digital experiences. As per the opinion of Zhao et al. [27], the Phygital experience is an emerging force in sensory marketing that is deeply en route to consumers’ emotions. Furthermore, it works as a bridging gap to provide a seamless integration in physical marketing. A seamless transition is ensured between the online and offline worlds of a business to provide an engaging experience to consumers across the touchpoints [28]. Technologies such as AR and VR can be acknowledged by brands overlaying digital elements and initiating an immersive digital environment.



**Fig. 2.** a) Blend of physical and digital experience at Amazon, b) Retail phygital experience, c) Phygital store experience

Source: [28]; [29]; [9].

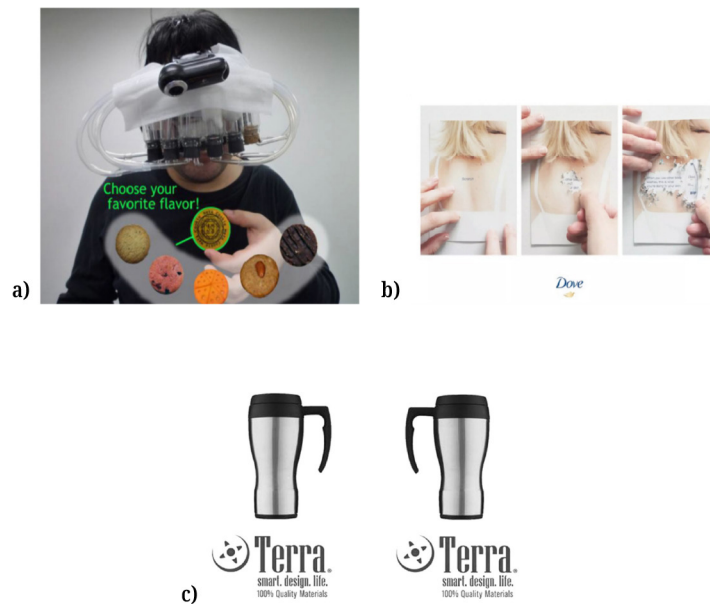
Physical experiences work as a holistic approach for global companies and marketers as they allow a simultaneous engagement of multiple senses. It creates a more memorable interaction with consumers, for instance, consumers can virtually try on clothes in a store while experiencing a subtle smell of the signature fragrance of the brand in the store, as illustrated in Figure 2 [29]. The implementation of digital technologies can amplify such experiences that create a more impactful presentation of the products offered by the brands. Such marketing also leverages both physical and digital elements to understand consumer preferences so that an emotional resonance can be activated to make consumers value [9].

## 4.2 OVR: A new method to stimulate the senses in a virtual environment

**OVR creates tactile sensations.** OVR technology's approach in sensory marketing focuses on engaging multiple senses so that brands can create a memorable yet impactful experience for consumers [12]. For instance, the OVR technology allows brands to create a custom scent that can be released by syncing it with AR and VR content. The idea behind such an innovative initiative is to enhance the sensory experience of consumers while they interact with a brand and to understand their emotional connection to the sensory stimuli [15]. An example of the application of OVR can be seen in a furniture showroom that can create a VR experience, providing customers with an opportunity to explore various types of wood used in the furniture.

Global companies are applying sensory marketing by engaging different senses for brands to create an immersive experience. Customers are showing better engagement with this specific marketing strategy, and business organizations are recognizing the emotional touchpoints of customers [17]. It leads to a better scope for product development to meet the changing needs and preferences of consumers as well. Brands are increasing awareness, loyalty, and sales by strategically implementing sensory marketing. On another note, Niedenthal et al. [20] have presented that OVR technology can utilize electro-tactile stimulation, creating tactile stimulation such as buzzing or gentle tingling. As a result, sensory storytelling and virtual product testing are effectively done using sensory marketing to connect with customers emotionally.

**Enhancing product interactions.** Marketers use sensory marketing as a powerful tool to improve product interactions and offer a better experience to customers. As discussed by Andonova et al. [21], sensory marketing allows brands to forge a deeper connection with the audience and influence their purchasing decisions. Moreover, this marketing technique allows the creation of a multisensory experience using sensory cues to understand the emotional association of various human sensory stimuli. However, the application of the sensory components needs to be consistent in conveying the values and messages of the brand [19]. In this way, brands are strategically engaging senses to initiate a deeper connection with the audience.



**Fig. 3.** a) Digital sensory marketing, b) Sensory marketing used by Dove, c) Mental stimulation and visual depiction

Source: [17]; [20]; [18].

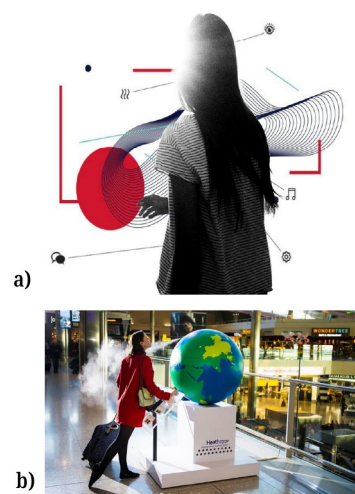
Sensory experience and consumer preferences are connected, which provides an analytical viewpoint to brands. It deepens the understanding of brands' consumer expectations so that product development and projection can be done accordingly [18]. For instance, Apple stores use sensory marketing using minimalist designs and tactile experiences of the company's products to impose a sense of innovation and sophistication. Figure 3 presents types of digital sensory marketing, one used by Dove, and the mental stimulation of products. On the other hand, natural scents, vibrant colors, and hands-on product demonstrations are done in Lush Cosmetics, engaging multiple senses and initiating an interactive shopping experience for customers.

**Need for a stronger emotional connection.** The competitive business world requires brands to offer beyond functional products and their marketing. As mentioned by Archer et al. [12], global brands are currently focusing on building emotional connections with consumers by using sensory marketing. This particular marketing strategy helps in achieving a higher emotional bond with customers by engaging various senses. Liu et al. [15] have expressed that emotions play a vital role in the decision-making of consumers. They tend to be loyal to the brands that they feel emotionally connected to. Emotionally charged experiences of consumers can be easily recalled by them, which strengthens brand loyalty.

Sensory marketing works better to evoke specific emotions as it allows brands to work on different stimuli to associate with customers' emotions. For instance, vibrant colors are used by brands to evoke excitement, or the scent of lavender is used to promote relaxation [17]. Brands tend to create a meaningful and deeper connection with their target audience that drives business success. Sensory elements add richness and depth to the narratives and storytelling of companies, making them more engaging as well as memorable. Clothing companies are using high-quality textures and fabrics, creating a sense of comfort and luxury that can help foster an emotional connection between consumers and the products [20].

### 4.3 Cross-sensory marketing: The future of marketing technologies

**Sensory marketing in customer experience.** Keller & Spence [30] have referred to cross-sensory marketing as a strategy using multiple senses, such as sight, smell, taste, sound, and touch, to initiate a holistic brand experience. This type of marketing strategy is found to be especially beneficial for enhancing customer experience, as it increases brand engagement. Brand recall and recognition can be significantly improved by cross-sensory marketing by generating an emotional connection as well [31]. Customers can obtain an immersive experience before engaging in a shopping experience that helps increase sales of brands. Retail companies use sensory marketing by combining multiple senses, such as in coffee shops, focusing on enticing aromas and cozy atmospheres to attract potential customers [32].



**Fig. 4.** a) Illustration of sensory marketing, b) Building a multisensory brand

Source: [33]; [34].

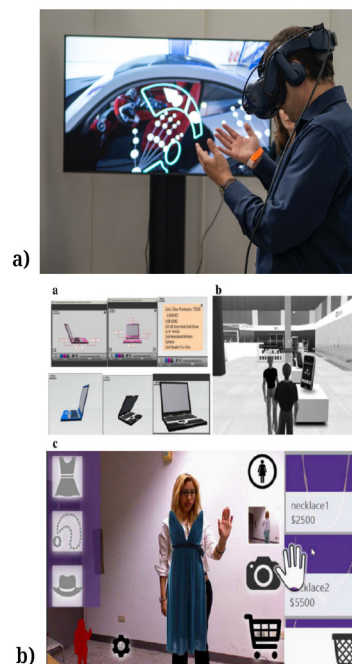
The usage of sensory marketing can be further beneficial for companies in terms of experiential events by combining various senses. Figure 4 demonstrates sensory marketing that can be used to create a multisensory brand. For example, product launches, festivals, and concerts can be organized using cross-sensory marketing to create a shareable experience [35]. Design packaging can be included in this context that also engages human senses in marketing strategies, such as textured packaging, packaging containing a distinctive sound, or scented packaging. Best practices of sensory marketing might include knowing the audience so that combined senses can trigger their preferences, behaviors, and values [36]. As a result, multiple senses can be integrated for a holistic and immersive experience.

**Sensory marketing in detecting consumers' emotions.** Sensory marketing is regarded as effective where various stimuli can be directed to trigger the five major senses of consumers. As per the view of [37], sensory marketing focuses on influencing the perceptions and emotions of customers to positively impact their buying decisions. In addition, it helps in establishing a positive relationship between brands and consumers by identifying the emotional factors. Offering a sensory experience to customers can help brands understand strong emotional responses. However, as argued by Spence et al. [38], association with memories can be more encouraging for consumers who evoke positive emotions as well as purchasing behaviors.

Thus, brands can create a different identity by initiating an emotional attachment with consumers.

On another note, sensory marketing has potential drawbacks that are essential to be considered while applying it. Keller & Spence [30] have pointed out that sensory marketing is a complex process that might be challenging in terms of its execution. It requires exact identification of the senses to be used or combined as per the emotions of consumers towards the brand's products. Besides, specific resources and technological expertise are also essential, requiring high cost and implementation. Additionally, it can be overwhelming or overestimating without proper execution, which must also be acknowledged [31]. Therefore, an accurate outcome of sensory marketing and emotional connection with the customers can be ensured.

**Sensory marketing in emotional influence.** The emotional benefits of applying sensory marketing can be seen as it results in increased brand loyalty by emotionally influencing consumers. According to Sun et al. [32], forming an emotional connection with the target audience improves customer experience as it determines their preferences from an emotional point of view. Brand loyalty and advocacy can be obtained by brands by using sensory marketing appropriately. Moreover, emotional engagement is increased by using sensory marketing, as it encourages customers to share their experiences, creating a social buzz [35]. Consequently, brands can be differentiated from their competitors and create a memorable experience.



**Fig. 5.** a) Multisensory social media, b) Integrating multisensory technologies

Source: [39]; [31].

Multisensory social media marketing is used by marketers as a powerful marketing technique so that brands can induce memories, feelings, and other associations with a brand that positively impact customer behavior, as shown through Figure 5 [36]. In this context, the sensory marketing of Disney can be mentioned to engage with multiple senses of consumers, building an emotional connection to inspire brand loyalty. In contrast, sensory marketing needs to be consistently used

across all the touchpoints that help reinforce brand experience [37]. As a result, an effective measurement and evaluation of sensory marketing can be obtained with the refinement of emotional influence on consumers.

## 5 DISCUSSION

The focus of the research and its findings relied on the emerging concept of sensory marketing to understand consumers' emotions. The application of SI theory has emphasized that human senses help in understanding experiences that need to be considered by modern marketers to tailor marketing strategies [14]. They can use human senses such as taste, touch, sound, sight, and smell to provide them with unique experiences before making purchasing decisions. Several sensory marketing technologies have been explored through the research, providing the idea that companies use color theory and flavor profiles to resonate with consumers [13]. Technologies such as HPLC and GC-MS help marketers in analyzing volatile and non-volatile compounds that contribute to tastes.

On another note, a critical discussion of the research elements reveals that the concept of a Phygital experience is growing in sensory marketing. Widyastuti [11] has suggested that global brands can incorporate data-driven insights from the Phygital experience to evoke a stronger emotional connection. Additionally, cross-sensory marketing action can enhance perceptions of brands among consumers, creating a more cohesive value of the brands to emotionally interact with customers [10]. The importance of OVR as a significant technology of sensory marketing has been highlighted in this study. It is found to have the potential to trigger memories and emotions among customers to improve their purchasing decisions.

## 6 FUTURE IMPLICATIONS

The current research has potential future scope, as it has determined the connection between sensory marketing strategy and the emotional connection of the brands with their consumers. Cardello et al. [16] have illustrated that brands often fail to connect with the audience emotionally, which can increase their potential to excel through marketing strategies. However, the study has expressed that various technologies are available that allow for providing a seamless virtual experience to consumers by understanding their emotions behind purchasing decisions [11]. Exploring such ideas through the current study has made it significant and can offer effective knowledge to future research on similar backgrounds.

### 6.1 Need for research

Further research must be conducted in various areas of sensory marketing that can result in a better outcome in its academic context. The following questions can be explored in future research so that further concepts of sensory marketing can be applied to increasing the understanding of emotional connection with consumers.

*How to enhance sensory marketing in terms of emotionally connecting with the audience?*

Marketers need to focus on all five primary senses of consumers and strategically use them to obtain the maximum outcome from the immersive experience.

Hamacher & Buchkremer [40] have shared that sensory marketing needs to align the feelings, memories, and associations of customers. Moreover, the sensory stimuli used in this process need to consider sounds, smells, textures, sights, and tastes to resonate with the demographic oriented to the business. Consistency is the key when it comes to the application of sensory marketing across various marketing channels [41]. The understanding of the audience can be maximized by emphasizing such elements and aligning multiple senses to the brand's value and personality.

Marketers can focus on the storytelling of the brand by incorporating sensory details so that the marketing narratives can generate a deeper emotional attachment with consumers. In this context, Kaushik & Gokhale [39] have shared that triggering positive memories can be done by using particular scents that consumers can emotionally associate with and create a memory with.

*How to decide the technologies to be used in applying sensory marketing in a business?*

This is a significant question to be explored, as the capability of sensory marketing can be obtained only by using effective technologies and techniques associated with this marketing strategy [38]. For instance, companies can use scent diffusers, which are a commercial element, and can create a positive memory with consumers. Various soundscapes, sensory cues, and visual branding can be used by business firms to create sensory encounters with consumers. It assists in creating a long-lasting impact on them so that brand recall and customer loyalty can be significantly enhanced.

Sensory marketing focuses on arousing emotions, leading to a deeper connection with consumers and continuing it for the benefit of the business. Customers can be appealed to through a multisensory level that brands can use and leverage their marketing strategies in significant ways [39]. Brand images are personified and intensified with such innovative marketing strategy applications. This particular marketing technique is also considered to be effective in capturing the audience's attention, which makes brands memorable to their audience. Thus, exploring this question can be beneficial in having a deeper understanding of sensory marketing to resonate with consumers' emotions.

*How can marketers decide sensory marketing strategies to stay ahead of the market competition?*

The current business environment is dynamic, and sensory marketing can result in innovative offers for consumers. The approach of sensory marketing aims to deeply dive into the understanding of consumers [33]. Furthermore, a detailed explanation of these questions will provide information on demographics to understand the lifestyles, values, and sensory preferences of customers. Companies can acquire data and information from sensory marketing to comprehend emotional responses to various sensory stimuli [42]. Therefore, information on the sensory experiences of consumers can be acquired by brands to gain competitive advantages.

Marketers can use sensory marketing to embrace experimentation and innovation by exploring new sensory combinations. Companies are encouraged to pair unconventional senses to create more shareable and unique experiences that have not been experimented with before [43] [44] [45]. Technological integration can be further influential for companies and marketers, enhancing the outcome of sensory marketing. Interactive displays, VR, AR, and OVR can be effectively used by businesses to tailor personalized sensory experiences for consumers [34]. Therefore, a critical exploration of this question can highlight the individual preferences of customers by engaging with their senses.

## 6.2 Implications of the research

The application of sensory marketing can be seen through real-world global businesses. For instance, flavor profiles are often used in the food industry through sensory marketing, and technology plays an integral role, particularly for food and beverage brands [7]. It offers a detailed description of the included sensory characteristics of a food or beverage. In addition, the concept of tactile marketing can be mentioned in the retail industry, which can be utilized by marketers considering the feelings of packaging, products, and different retail spaces to demonstrate the luxury and quality of the products [32].

## 7 CONCLUSION

The critical review of the study has shown that sensory marketing has become an influential concept for emotionally connecting with the target audience of a business. Sensory design in marketing encompasses various senses such as taste, touch, smell, and sight. Moreover, the progress of sensory marketing is likely to improve the product purchasing decisions of consumers. Customers can virtually feel products before purchasing, which infuses an emotional touch and positively influences their decision-making. The impact of sensory marketing tends to be positive with the right implementation and strategies. For instance, practical sensory marketing strategies in businesses might include reinforcing visual effects for brand identity to stimulate the sense of sight or providing tactile experiences to stimulate the sense of touch. Besides, the review highlighted the importance of digital features and technological benefits that have enhanced the outcome of this marketing.

It is believed to enhance the perceptions of products among the target audience, introducing new modes of experiential product consumption. On another note, various instances have been presented through the study showing how global companies are incorporating cross-sensory marketing strategies to have better interaction with consumers. In this way, consumer experience is evoked by stimulating their senses and establishing a bridge between global business firms and consumers.

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