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MULTISENSORY DESIGN: PRACTICAL CONCEPT TO EMPOWER PRODUCT PACKAGING DISPLAY IN E-TAILING

Leila Denmamode
School of Innovative Technologies and Engineering, Department of Creative Arts, Film and Media Technologies, University of Technology, Mauritius, La Tour Koenig, Mauritius
ldenmamode@gmail.com
ldenmamode@umail.utm.ac.mu

Abstract

The digital environment has become the centre of the world with Covid-19 crisis. Businesses have been readjusting their strategies to respond to consumers' needs and to survive the economic turning point. It is now more than ever vital to exist in a digital world with a distinctive competitive edge. However, investing in emerging technologies is not within the reach of every business owner. Consequently, this paper aims to combine practical technology with multisensory strategy and packaging design to attend to the immediate needs of businesses while addressing the challenge of connecting e-shoppers to products emotionally. The study adopts theories involving website design, packaging design, and multisensory design to construct a new concept intended to empower product display at phases of adding to cart and placing order. Findings showed that above all packaging design's attributes, features providing touch perception are the chief factors

contributing to evaluating products positively in e-tailing. Through websites' interactive features, e-shoppers perceive a closeness with the product. The present research proposed a new concept named Interactive Appearance to enhance the product experience during online shopping activity. It further demonstrated that packaging design's features and website design's features are complementary to provide a positive condition for online shopping.

Keywords

Multisensory Design, Digital Packaging, Sensory Experience, Interactive Appearance, E-Tailing

1. Introduction

E-commerce is currently experiencing an unprecedented expansion due to the Covid-19 pandemic. The lockdown situations and fear of contracting the virus have compelled a change in consumers' purchasing behaviour while urging many businesses to move online (Nivethitha, Manjula, & Mallika, 2020). The immediate need to exist online to reach consumers on a 24/7 basis has flooded the online retailing environment with a plethora of products creating fierce competition within the e-commerce market (Roggeveen & Sethuraman, 2020).

The forced transition is a challenge for many businesses, new to the digital environment. In numerous cases, these businesses are struggling to empower their presence online due to insufficient budget to invest in emerging technologies strategy. Their lack of competitive edge results in weakening their performance in the digital environment. In turn, consumers new to online shopping often struggle to process information because of limited product descriptions and images provided by the sellers (Kim R. Y., 2020).

However, for brands to perform and be present in a competitive market, "it will become more important for many firms to be smelled, to be heard, to be seen, to be tasted, or to be touched…" (Hultén, Broweus, & Dijk, 2009, p.32). According to Pang & Ji (2010, p. 314), "sensory experience plays a critical role in guiding online consumers' behaviour via reducing their perceived risk." Besides, Wu, Lee, Fu, & Wang (2014, p. 18) concluded that emotional and sensory approaches to marketing and branding are now meaningful recommendations for e-tailing marketing strategy and the "emotional side of consumer behaviours should be emphasized more in future online marketing practices."

Facing the emergence of the situation, the present study aspires to assist businesses' transition to an e-tailing environment through practical multisensory design solutions while

foreseeing opportunities to enhance product evaluation and online shopping experience. The research objectives of this paper are: (1) to explore multisensory opportunities for the digital environment; (2) to evaluate multisensory perspectives of packaging design in e-tailing; (3) to develop practical multisensory design concept given empowering digital packaging experience in e-tailing.

2. Literature Review

2.1 Technological Attempts to Induce Multisensory Experience

Research in digital technology is progressing rapidly. With the growing understanding of human sensory perception, revolutionary opportunities are under development to offer customers holistic sensory experiences through digital technology. Many are still under laboratory experimental phases while a few prototypes are being tested on a niche market (Gosain & Sajwan, 2014; Nield, 2014; Spence & Gallace, 2011).

In early 2000, 'DigiScents, an interactive media company, created iSmell Digital Scent Technology, with an aim to broadcast scents over internet' (Gosain & Sajwan, 2014, p. 2808). Another smell device named Aroma Geur was developed in 2004 to offer olfactory emails (Gosain & Sajwan, 2014). Later in 2005, TriSenx presented a device named Scent-Dome to emit scents for websites. However, none of these devices was commercialised except the Osmooze Personal Diffuser (Gosain & Sajwan, 2014). More recently another external device named Scentee was developed for smartphone (Nield, 2014). It is plugged into the smartphone headset socket and scent packs are inserted to defuse a selected smell at set time or conditions (Nield, 2014). The latest revolutionary device launched in mid-2014 is the oPhone. The oPhone user can mix and match aromas creating up to 356 combinations. Though many of these technological developments are still under experimental phases, researchers are convinced that olfactory experience will soon provide a competitive edge to communicate emotional and sensory experience on the internet (Petit, Velasco, & Spence, 2019; Gosain & Sajwan, 2014; Hultén, et al., 2009).

The tactile experience is another aspect of product design that has undergone huge technological advancement lately with the introduction of touch screen. Touch screen increases interaction between consumers and products encouraging positive emotional experience (Hultén et al., 2009). In early 2000, Kyung, Kim, & Kwon (2007) presented a haptic computer mouse that communicates texture feedback including patterns, gratings, and roughness. The mouse

transmitted tactile feel of a certain type of texture whenever the cursor moves on a registered textured surface on a screen (Kyung et al., 2007). Despite this progress, 'however, we are still a long way from commercially viable (and realistic) haptic interfaces that can bring the tactile attributes of the retail shopping experience into the average home' (Spence & Gallace, 2011, p. 294).

Another research area that is experiencing growth is virtual reality (VR) technology. It combines multiple human-computer interfaces to offer various sensations including visual, haptic, and auditory, which give the user a sense of presence in the virtual world (Bonetti, Warnaby, & Quinn, 2018). Wasko, Teigland, Leidner, & Jarvenpaa (2011) mentioned that VR technology offers an engaging experience, navigation and interaction in a digital world, and can be significant and effective for online marketing purposes (Wasko et al., 2011). Further emerging technology is the augmented reality (AR) which captures real-world data using a digital camera to provide visuals that attract consumers' interest by allowing them to interact with virtual products. 'However, academic research on, and practical applications of, AR and VR in retail are still fragmented' (Bonetti, et al., 2018, p. 119).

To summarise, it was observed that huge technological progression has taken place in the various field combining multisensory experience to digital technology; however, their accessibility to mass-population is almost non-existent. As a result, the present research focused on practical approaches available for mass-population.

2.2 User-Oriented Website Attributes for E-tailing Environment

Past studies identified two categories of website attributes: (1) technology-oriented and (2) user-oriented. Huang (2003) specified that user-oriented attributes of websites have greatest influence on user decision-making. Similarly, Wu et al. (2014) declared that web stores' layout design and ambiance have significant impact on online shoppers' emotional state and purchasing intentions. Moreover, Soiraya, Mingkhwan, & Haruechaiyasak (2008) classified visual layout components of websites (such as navigation bar, product index bar, customer service bar, and cart among others) and presentation features of webpage (like typography, colour and layout style) as substantial factors determining the interest of e-shoppers to browse products and stimulate online purchases.

Likewise, Demangeot & Broderick (2006, p. 325) stressed on the fact that 'enjoyment' is part of online shopping activities and further revealed that experiential aspect of online shopping

'can be an objective of the shopper, but it can also be an outcome of the shopping activity, through exposure to the environment's cues'. Accordingly, various past studies deduced that websites' functional and design elements contribute to affect online shoppers' emotional states (Wu et al., 2014; Karimov et al., 2011; Cyr, Head, & Larios, 2010; Demangeot & Broderick, 2006; Huang, 2003). As a result, the present paper is taking into account websites' functional and design elements liable to provide practical usage and at the same time positive experience in e-tailing.

2.3 Exploring Sensory Experience Opportunities for Packaging Design

In the physical environment, stimuli generate experiences directly through consumers' five senses; whereas e-tailing environment primarily relies on visual experience (Spence & Gallace, 2011). But, for optimal sensory experience the other senses such as sound, touch, smell and taste are weighty (Petit, et al., 2019; Hultén et al., 2009). Using an additional technological device, sound can be transmitted directly to e-shoppers (Parsons & Conroy, 2006). Besides, past investigations showed that sensory organs do not function in isolation; on the contrary, they interact to create emotions and feelings (Spence & Gallace, 2011; Hultén, et al., 2009). Their argument stipulating that information captivated by a single sensory organ spontaneously catches the attention of the other senses can be taken into account for e-tailing context even though sight and sound are the predominant sensory channels.

On the other hand, in a physical retailing environment, packaging design is viewed as a powerful marketing tool with multiple roles including enhancing brand awareness and strengthening consumer-brand relationships (Wells, Farley, & Armstrong, 2007), providing sensory experiences provoking emotional reaction and encouraging longer interaction between customers and products (Spence & Gallace, 2011), affecting consumers' perception of product's value and influencing purchase decision at the point of sales (Rusko et al., 2011). Following these past studies, this paper proposes to identify and evaluate the multisensory attributes of packaging at important phases of e-shopping activity and to present packaging as a marketing tool that enhances product evaluation and experience in the e-tailing environment.

3. Concept Development Process

The observational study revealed that there are five main phases in online shopping. The first phase identified is 'Browsing'. It is the moment where brands fight for online shoppers' attention and interest. Online shoppers look for products, compare products' descriptions and

prices, and verify the authenticity and reliability of the offer. The effectiveness of brand visibility is critical in this phase (Denmamode & Ngo Siok Kheng, 2018). The second phase includes 'Adding to cart' which implicate online shoppers' evaluation of product and adding product to potential purchase list. The third phase is the 'Placing order' which involve a re-evaluation of products selected from the previous phase to the final purchase decision. A positive evaluation of products is vital at phase 2 and phase 3, to maximise the chance a product is being considered for purchase. Phase 4 consist of 'Shipping' and phase 5 is the 'Delivery'. The following timeline illustrates the phases and the corresponding basic actions carried out by online shoppers.

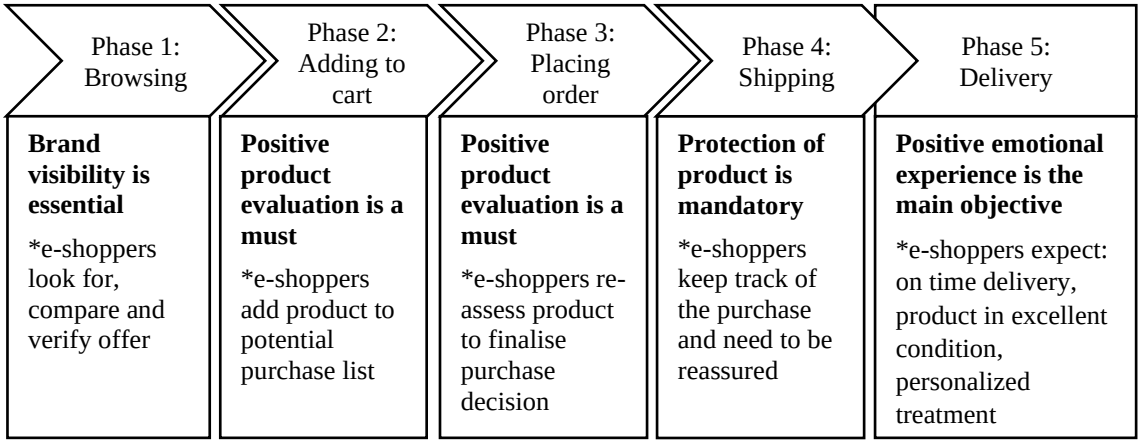

Figure 1: *Online Shopping Phase Timeline and the Corresponding Basic Actions Carried Out by E-Shoppers*

(Source: Observational Study)

Following the need to ensure positive evaluation of products in e-tailing and enhance the online shopping experience, this paper mainly focuses on strategies to be used at phase 2 and phase 3 of online shopping. Consequently, the following details the strategy development process and the managerial implications for the proposed concepts.

3.2. Multisensory Strategy to Enhance Product Experience for E-tailing

Past studies established packaging design's graphical and structural features as a significant influence on consumers' product evaluation in the physical environment (Rundh, 2013; Young, 2008; Silayoi & Speece, 2004; Underwood, 2003; Schoormans & Robben, 1997). The present research attempted to identify how these packaging design attributes are applicable in an online shopping environment. Further, multisensory perception of these attributes was explored for online shopping. Findings showed that above all packaging design attributes, interactivity providing

touch perception is the principal factor contributing to evaluating products positively in e-tailing. Results obtained from descriptive statistics, supported by online shoppers' verbatims, disapproved static presentation of packaging while further indicated that interactivity when combined with various packaging design features, was highly viewed as susceptible to contribute to positively evaluate products during online shopping. Through websites' interactive features, online shoppers perceive a closeness with the product. Interactivity allows them to virtually manipulate the product even though they mentioned that there are technological limitations. Some online stores recently introduced options like 360˚ view and 3D virtual try on. However, these technologies are not widely used since the investment cost is high according to business owners who were compelled to join e-tailing during Covid-19 period. Informal discussions with these business owners revealed that those in the digital transition barely have the budget to invest in these technologies since they are struggling to retain their existing clients and at the same time 'hunting' for new ones.

In consequence, this study used accessible website interactive features together with packaging design features to develop a concept as an instrument liable to contribute to positively evaluate product during online shopping. The concept named *Interactive Appearance* mainly assisted in the visual aesthetic of packaging design where layout and theme representation were major aspects covered. A set of variables, having multisensory attributes, were identified and tested as indicators for product evaluation in e-tailing. As illustrated in the following bar chart, after the touch perception (3.17), smell perception (2.96), form (2.94) and layout strategy (2.83) are among the leading features measured as apt to evaluate product positively during e-shopping.

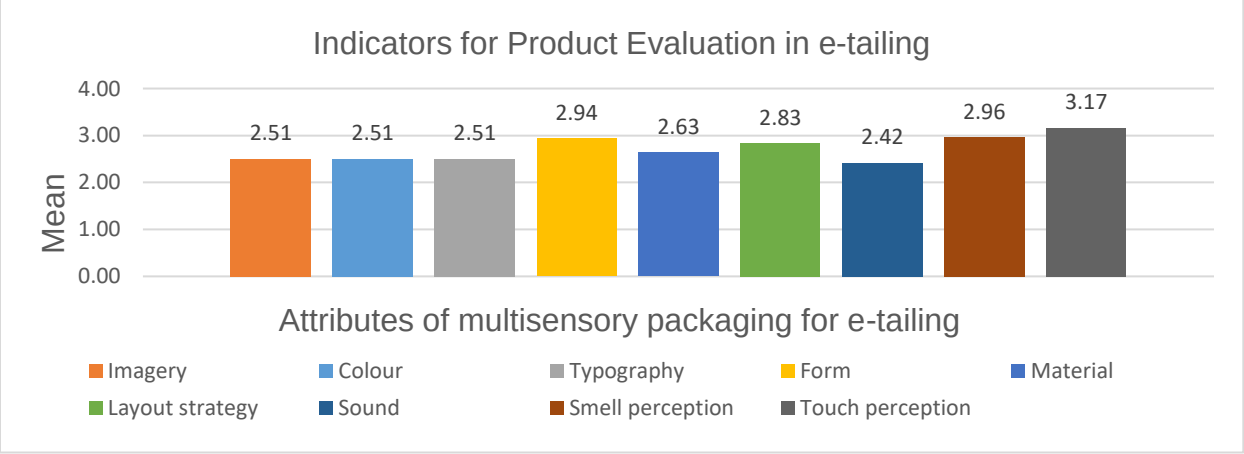

Figure 1: *Indicators for Product Evaluation in E-Tailing.*

(Source: Field Research, Microsoft Excel)

Regardless of products' type, results suggested that respondents were inclined to primarily evaluate a product based on the perception of touch experience which in most cases are showcased visually through the product's structure, the imagery on labels, and interactive website as well. The following table shows is the sample results of the descriptive statistic for indicator 'Touch Perception'. Respondents evaluated item 'interactive website interface' as the most influencing indicator for touch in product evaluation during online shopping. Overall most items had favourable responses. However, items 'material texture' and 'static presentation of packaging' obtained a mean value lower than 3.00.

Table 1: *Descriptive Statistics for Indicator Touch Perception as Interactive Appearance*

Items	Favoured Response	Frequency (n)	% response	Mean value for n=36	Std. Dev for n=36
Form of packaging	Agree	17	47.2	3.25	1.713
Imagery on label showing product feel (liquid, creamy)	Agree	18	50	3.28	1.649
Imagery on label showing healthy/soft skin of model	Agree	18	50	3.31	1.636
Material texture	Agree	15	41.7	2.97	1.682
Robust material for delivery packaging	Agree	15	41.7	3.22	1.623
Packaging navigability	Agree	15	41.7	3.25	1.663
Interactive Label	Agree	10	27.8	3.19	1.721
Interactive website interface	Agree/ Strongly agree	12 12	33.3 33.3	3.47	1.748
Animated presentation of packaging	Agree	12	33.3	3.22	1.791
Static presentation of packaging	Neutral	13	36.1	2.50	1.483

(Source: SPSS)

After conducting Factor analysis (FA) and Hierarchical Cluster Analysis (HCA) using Ward's method on all retained variables, five clusters were identified. Cluster 1 contained variables related to form & layout for product and delivery packaging; cluster 2 grouped variables related to product/sector theme and multisensory expression using sound; cluster 3 is related to the visual representation of the product/sector theme; cluster 4 represented guides for colour usage; cluster 5 provided a hint on product showcase. Table 2 shows the simplified analysis of each cluster.

Table 2: *Analysis of Clusters for Interactive Appearance*

Cluster	Indicator code	Variables	Sensory channel fulfilled	Elements of packaging	Elements of website
Cluster 1	formAPPEARANCE6	Ergonomic form	Touch	Structural design	-
	formAPPEARANCE7	Customized form for delivery packaging	Touch	Delivery packaging	-

				structural design	
	layoutstrategyAPPEARANCE2	Horizontal orientation	Sight	Labelling	-
	typoAPPEARANCE4	Handwritten type	Sight	Labelling	-
	layoutstrategyAPPEARANCE4	Roomy	Sight	Labelling	-
Cluster 2	typoAPPEARANCE9	Customized typography design	Sight	Labelling	-
	soundasAPPEARANCE8	Sound related to nature (e.g. water, birds, trees, wind)	Sound		Theme to complement labelling
	soundasAPPEARANCE7	Instrumental music	Sound		Nature of sound
Cluster 3	colourAPPEARANCE1	Theme related colour palette	Multi-sensory	Theme representation	Theme representation
	layoutstrategyAPPEARANCE1	Vertical orientation	Sight	Labelling	-
	imageryAPPEARANCE4	Digital drawing	Sight	Nature of imagery	Nature of imagery
Cluster 4	colourAPPEARANCE2	Vivid colours	Sight	Basic colour	Basic colour
	colourAPPEARANCE5	Warm colours	Sight	Basic colour	Basic colour
Cluster 5	imageryAPPEARANCE1	Photography	Multi-sensory	Nature of imagery	
	soundasAPPEARANCE5	Female vocal sound presenting the brand and product	Sound		Product presentation

(Source: Self)

After interpretation of the result obtained, four design strategy dimensions as corresponding significant traits for product evaluation representing the Interactive Appearance concept were developed. Cluster 1 was named ‘packaging key traits’ and was sectioned in two categories, one representing product packaging traits and the second related to delivery packaging traits. Clusters 2 and 3 were grouped because both clusters had variables related to the theme thus forming a second category named ‘Theme experience’. Cluster 4 strictly related to colours, was named ‘Colour recommendation’. Finally, cluster 5 contained variables related to imagery and sound and was named ‘Product packaging showcase’. Thus (1) ‘Packaging Key Traits’, (2) ‘Theme Experience’, (3) ‘Colour Recommendation’ and (4) ‘Product Packaging Showcase’ were isolated as multisensory instruments for the concept Interactive Appearance. The following diagrams provide an overview of the proposed design dimensions.

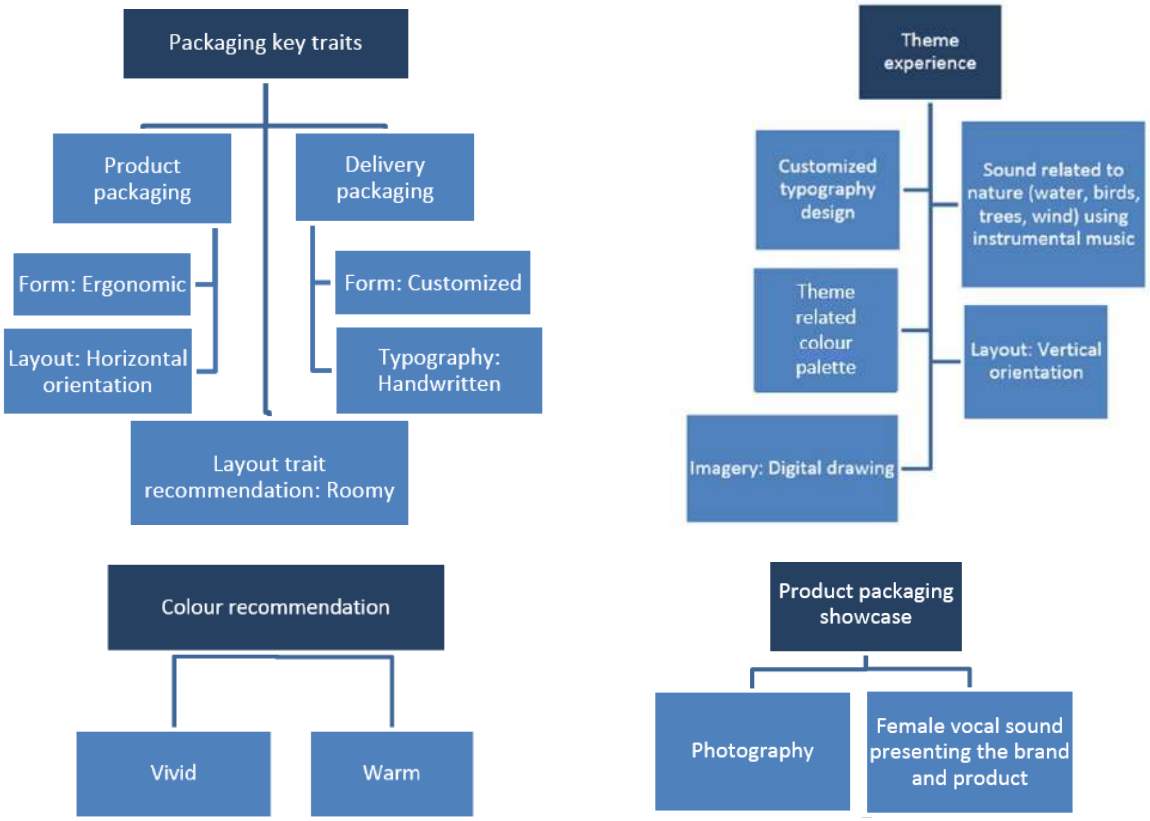

Figure 3: *Variables Classified Under Each Cluster - Cluster 1 Named 'Packaging Key Traits'; Clusters 2 and 3 Named 'Theme Experience'; Cluster 4 Named 'Colour Recommendation'; Cluster 5 Named 'Product Packaging Showcase'.*
(Source: Self)

'Packaging Key Traits' for the present research context emphasized structural design and layout strategy for both product packaging and delivery packaging. For product packaging, the ergonomic structure was suggested while for delivery packaging, the customized design was recommended. Following verbatims findings, these recommendations forecasted online shoppers' confidence and satisfaction. The majority of respondents stressed the importance of suitable delivery packaging since each product packaging and product category needs distinct logistical and handling requirements. As a result, 'Packaging Key Traits' was constructed to provide adequate design guidelines for both product packaging and delivery packaging so that online shoppers view the two types of packaging while shopping online. This may result in a positive evaluation of the product displayed for sale in e-tailing.

The second design strategy dimension of Interactive Appearance named 'Theme Experience' included guidelines for the visual representation of the product nature or category

implemented with related sound. These findings are in line with sensory experience theories where 'Theme' is a sight sense expression recommended for visual experience in general context (Hultén et al., 2009, p. 91). Further, Hultén et al. (2009) suggested that visual experience be reinforced by additional sense expressions such as music, voice, website interface design among others to offer shoppers a multidimensional sensory experience. Though these suggestions were not specific to online retailing or packaging design, statistical results obtained for the present research proved that they can be applied in such context. According to Hultén et al. (2009), sound associated with visuals can strengthen the multisensory experience. Past research related to the physical environment indicated that the interaction of both sight and sound sensory dimensions may in some context, provide a perception of smell, touch or even taste experiences (Underwood, 2003). Hence, 'Theme Experience' was established as an instrument providing a multi-dimensional sensory experience for the Interactive Appearance concept which may once more result in online shoppers' evaluating product positively.

A third section was strictly related to colour selection guidelines. This section named 'Colour Recommendation' was considered as an adequate instrument to contribute to evaluate product positively since colour is a fundamental visual feature in packaging design (Farmer, 2012; Klimchuk & Krasovec, 2013; Underwood, 2003), website design (Cyr et al., 2010) and consumers' emotional and sensory experience (Kim, 2013; Hultén, 2011). Finally, the fourth design strategy dimension named 'Product Packaging Showcase' revealed guidelines on visual and auditory presentation of brand and product. This design instrument is expected to be available as an option to complement visual and written communication of brand and product features. The proposal is consistent with Karimov et al. (2011) theory on factors involved in inducing trust in an online environment. Product showcasing may create a great impact on shoppers' perception thus may contribute to evaluating products positively while generating trust.

3.3 Visual Reference for Application of *Interactive Appearance* Concept

The present section provides visual references for the concept developed as *Interactive Appearance* on a fictitious basis. First, the design guidelines are presented in a table which is also used as a checklist to ensure that all parts of the concept are being tackled. Afterwards, the design guidelines are put into visuals. The visual reference is proposed in the form of a storyboard with related description and explanation.

The fictional context is considering a floral and herb based facial care line. The brand is entitled "Floral and Botanical". The e-tailing website gallery view shows 8 products at a time. The brand is proposing one product line having four variants. Design proposals for the visual reference are detailed in Table 3 following guidelines for the *Interactive Appearance* concept.

Table 3: *Details for sample visual reference in respect to Interactive Appearance concept*

Case study using Interactive Appearance concept	
Packaging Key Traits	
Product Packaging	
Ergonomic form	Cuboid, easy to handle, familiar form
Horizontal orientation layout	Product identity and brand name Interactive label – make use of peeled label concept
Roomy layout strategy	Minimum text; concise description using familiar language
Delivery Packaging	
Customized form for delivery packaging	Cuboid, set-up box style: tray with connected lid
Handwritten type	Informal script
Roomy layout strategy	Adhesive label on top in vertical position; logo/name in front and illustration on top
Theme experience	
Customized typography design	Floral and foliage inspired
Sound related to nature (water, birds, trees, wind)	Background sound for relaxing objective and to absorb e-shoppers' attention on product
Instrumental music	Background sound
Theme related colour palette	Floral and foliage colour palette and white
Layout strategy: Vertical orientation	On website – stacked product similar to shelf display
Digital drawing	Floral and foliage
Colour recommendation	
Floral, vivid, white, a touch of foliage	
Product Packaging Showcase	
Photography	Studio setting
Female vocal sound	Demo voice over presenting the brand and product

(Source: Self)

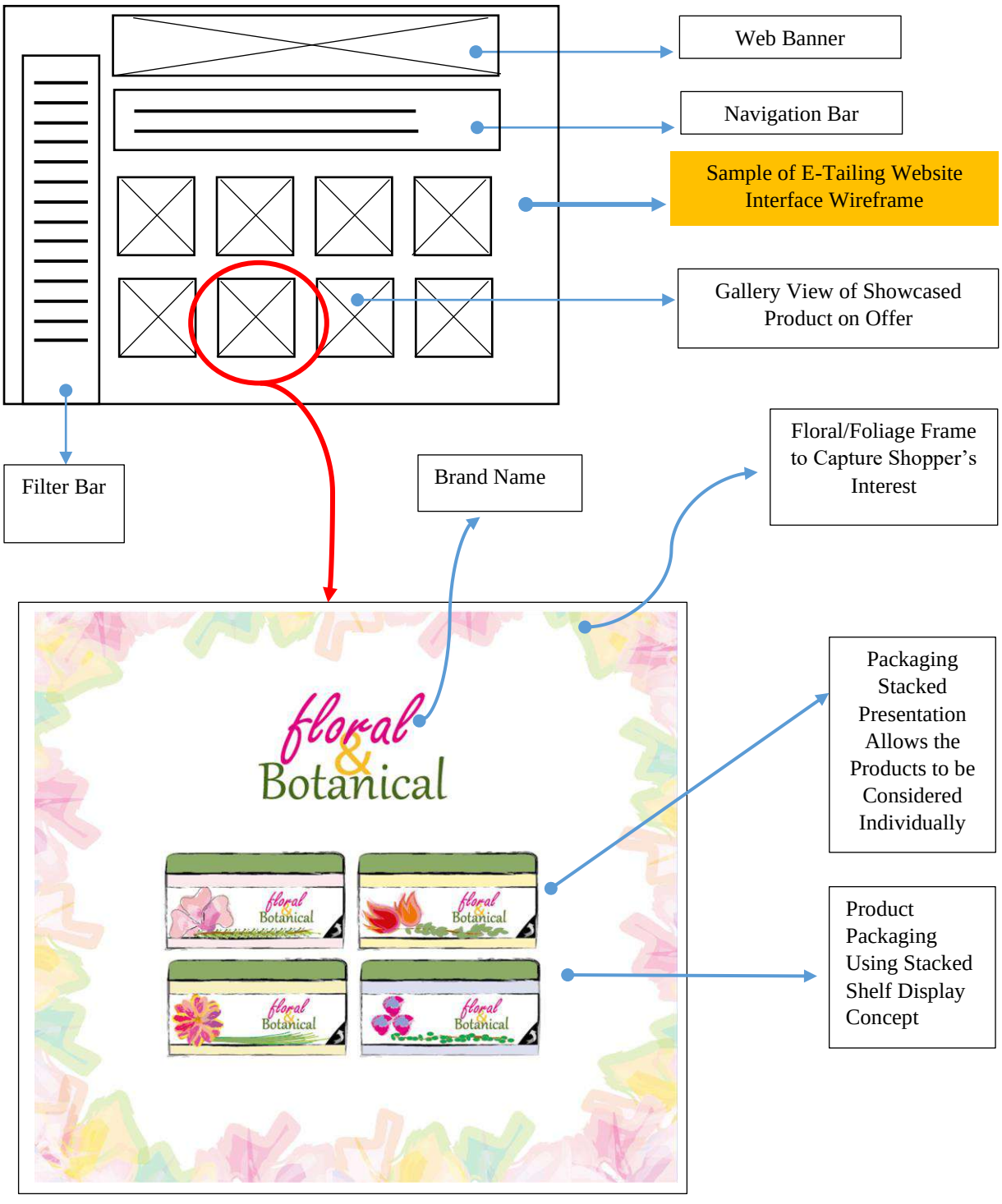

Figure 4: *Gallery View for Fictional Context*
(Source: Self-Designed)

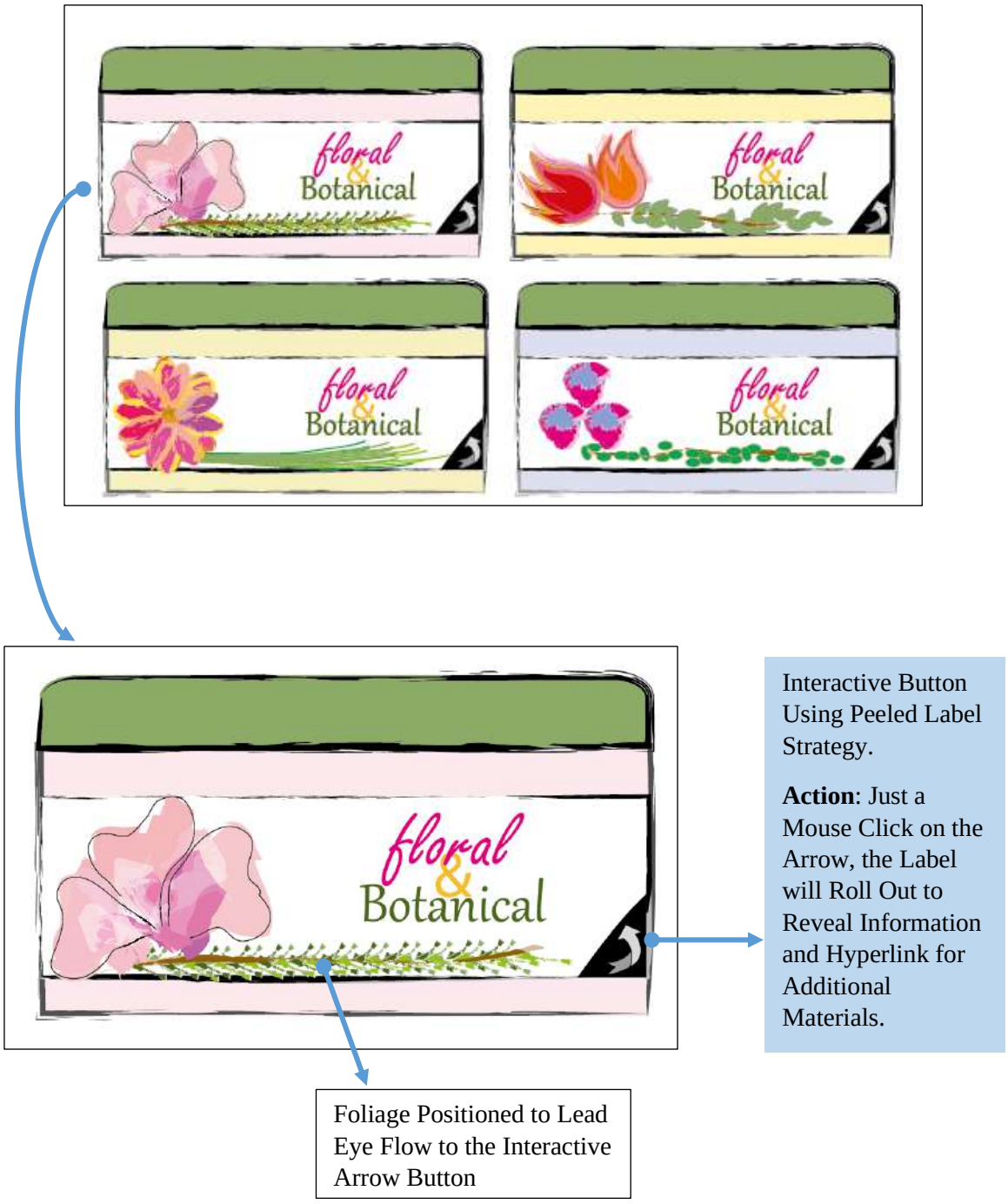

Figure 5: *Visual Reference for Interactive Label Using Peeled Label Strategy (Source: Self-Designed)*

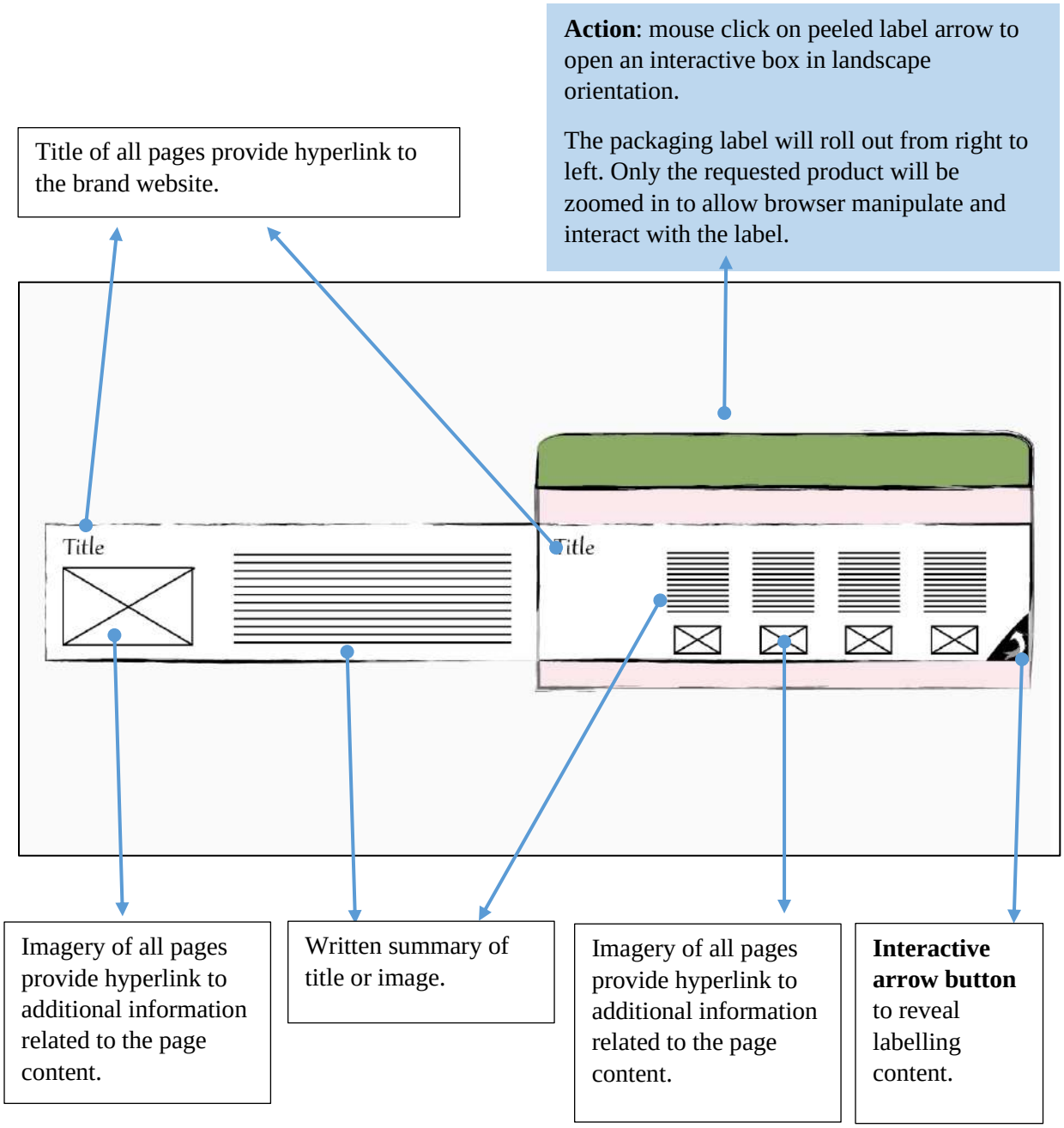

Figure 6: *Layout Strategy Flexible Template Applied for Digital Peeled Label to Support Product Evaluation*
(Source: Self-Designed)

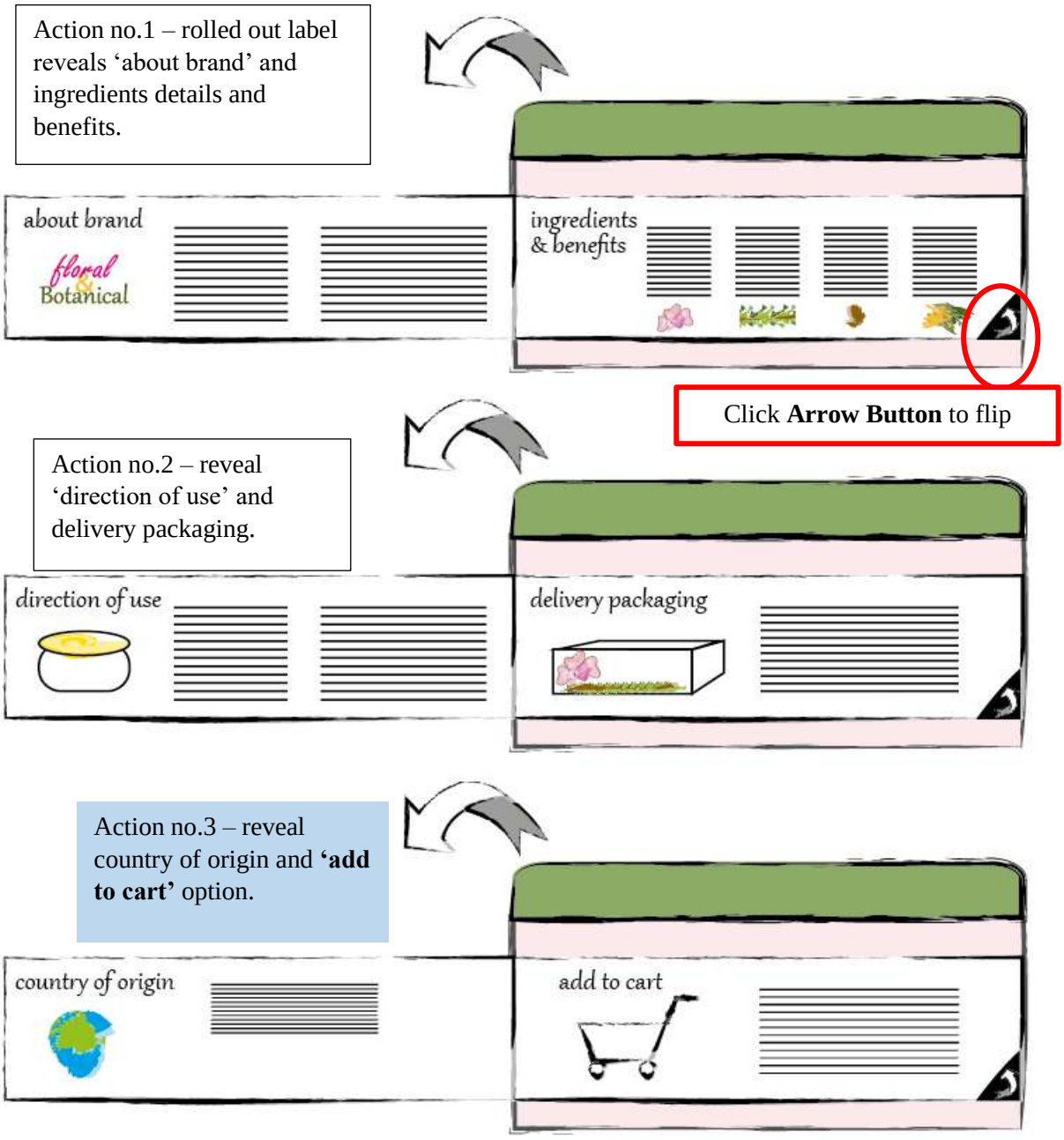

Figure 7: *Interactive Arrow Button in Action to Access Additional Information on Label (Source: Self-Designed)*

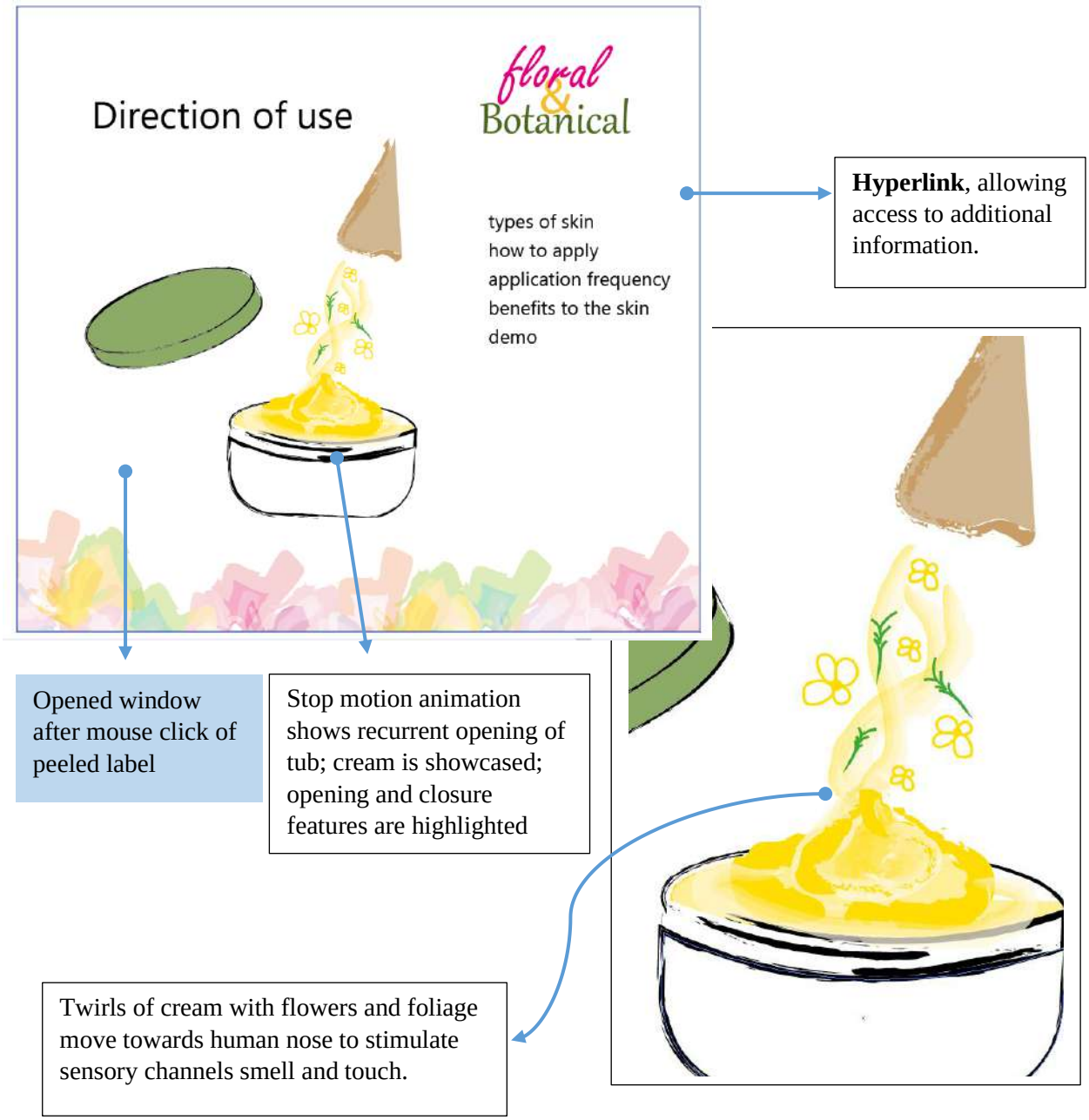

Figure 8: *Hyperlink Example for Direction of Use Where Stop Motion Animation Showcase Perception of Smell and Touch*
(Source: Self-Designed)

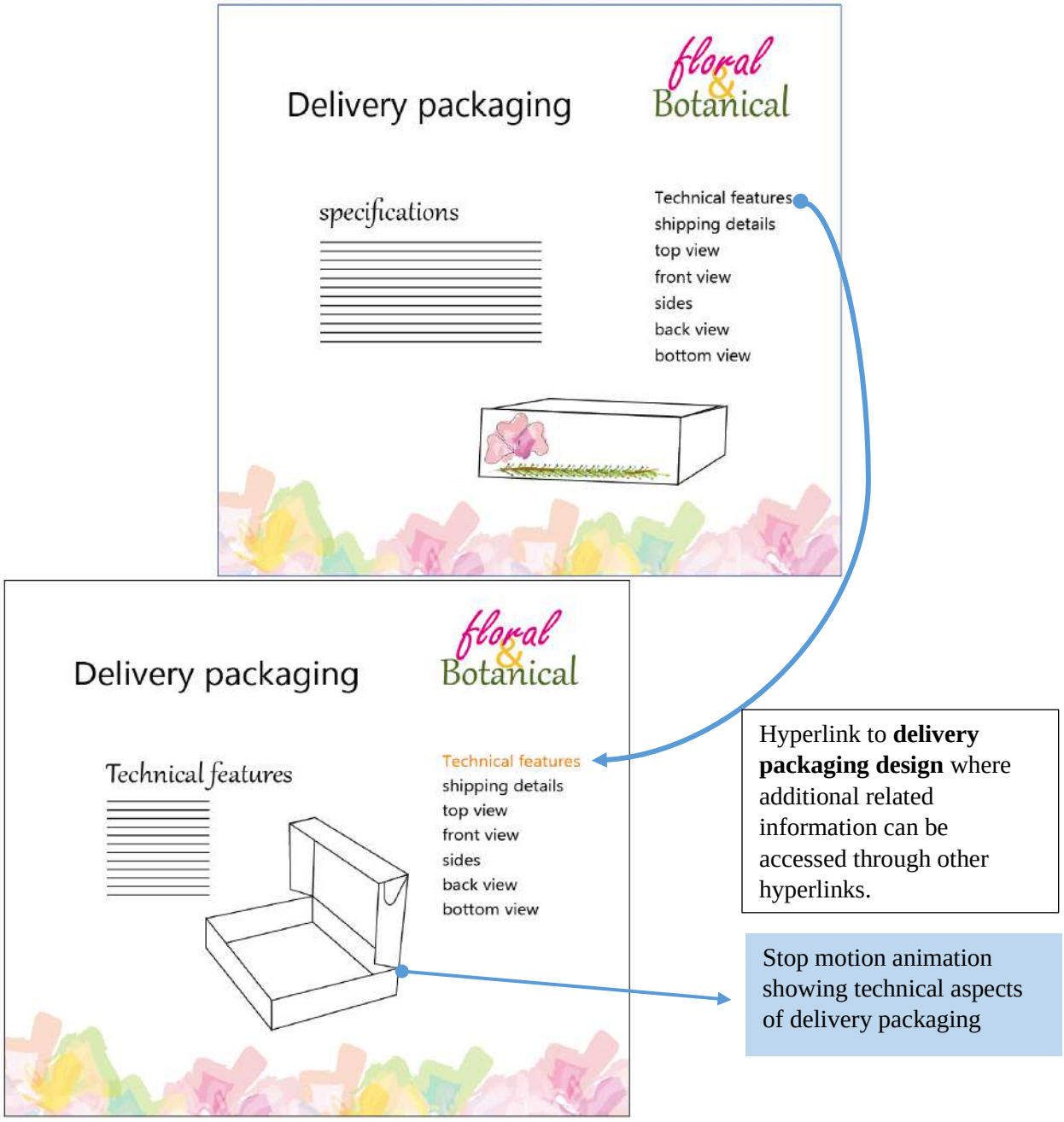

Figure 9: *Hyperlink to Delivery Packaging Features*
(Source: Self-Designed)

5. Conclusion

Practical findings demonstrated that visual and auditory experiences are considered direct sensory experience. Visual experience has a monopoly on the other sensory experience and it directs the perception of the other sensory feel. Further, visual experience is generated through

visual expressions related to graphical and structural attributes of packaging together with aesthetic and functional features of e-tailing website. This study established that packaging design features and website design features are complementary to provide a positive condition for online shopping. In the physical retailing context, package design attributes' appearance is recognised as an important feature that visually communicates product quality and performance (Velasco, Salgado-Montejo, Marmolejo-Ramos, & Spence, 2014; Young, 2008; Silayoi & Speece, 2007; Underwood, 2003). Results obtained for the present study indicated that packaging visual attributes continue to hold their significance in the e-tailing environment.

Besides, auditory experience is recommended to be optional in some context to avoid being intrusive. Auditory expressions range from background music reflecting brand story or theme to vocals explaining product/brand features and benefits. Additionally, it was found that tactile experience is omnipresent through the degree of navigability of online shopping website as well as the interactivity of product and their packaging including labelling. The more control online shoppers have over navigable and interactive features the more efficient is the perception of the tactile experience. Perception of tactile experience can be generated through visual expressions including structural attributes of packaging depending on context and product nature. Finally, perception of smell experience is subjected to product nature and is generated through visual expressions including colours, words, imagery and animation communicating aromas.

Consequently, the Interactive Appearance concept was established as a tool that provides distinct guidance for digital packaging with a multisensory approach using accessible website technologies intended for online marketing and e-tailing. Future research may assess the responsiveness of e-shoppers to interactive label design in a diversified context. Another research direction may evaluate the effectiveness of the Interactive Appearance concept in building e-shoppers' trust in products displayed in e-tailing.

With the constant growth of e-tailing, the need for innovative design and marketing strategies is expanding. Accordingly, the present research modestly contributed to the future insight of e-tailing pragmatically. This paper supports the notion that packaging design together with website features have the potential to influence online shoppers' emotions, sensory perception, affective responses, sense of evaluation, trust, shopping experience and purchasing decision.

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