Tuijin Jishu/Journal of Propulsion Technology
ISSN: 1001-4055
Vol. 44 No. 3 (2023)

Digital Marketers for Attitudes and Purchase Intentions Towards Modern Personalized Cosmetics, Impact of Manufacturing and Engineering Technology Management

Thanachit Rodpan[1], Sujanya Tubtong[2], Jessada Choanakij[3]

[1,2,3] Lecture of Digital Marketing, College of Innovation and Management, Suan Sunandha Rajabhat University, Bangkok, Thailand. E-mail: thanachit.ro@ssru.ac.th[1]

Abstract

Thailand's e-commerce cosmetics and personal beauty care market has grown by double digits, spawning a new field of competition that has migrated from offline in-store to online platforms. Despite its rapid growth, Thailand is still in the early stages of internet commerce. Not everyone in Thailand is comfortable or passionate about internet shopping. Given this market potential, the study's results will assist luxury cosmetic and skincare firms in better understanding the behaviors and expectations of Thai women, since best practices from other countries may not be applicable to the Thai market and clients. This study looks at the relationship between perceived value and trust in order to predict whether people will buy customized cosmetics online. To assess clients' desire to buy cosmetics online, a critical relationship between brand image, customer trust, and digital marketing must be established. Differences in customer demographics, behaviors, and expectations across physical locations will also be investigated, as will offline and online sales of counter-brand cosmetics and skincare. The study will analyze the elements that influence Thai women's online cosmetics and skincare purchases by using secondary data and observation to obtain information from 500 female participants. The participants were female internet consumers who had used products from the top three brands in the previous year: L'OREAL (LOR), Lancome (LAN), and Maybelline (MBL), and the respondents had "some" comprehension of customized cosmetics. Furthermore, participants must be a Facebook user for more than a year and a member of any Facebook cosmetics fan sites. Customers' demographic and psychographic characteristics, as well as their purchase behaviors, digital marketing strategies, and marketing methods, are among the key elements investigated. The findings of this study are intended to provide a more in-depth understanding of customer shopping behavior and expectations, as well as to identify the critical success factors that brands should prioritize when developing digital marketing strategies to influence female consumers' purchasing decisions through online shopping channels in Thailand.

Keyword: Personalized, Cosmetics, Purchase, Attitude, Engineering Technology, Digital Marketing.

INTRODUCTION

The cosmetics industry has undergone a remarkable transformation in recent years, driven by advancements in manufacturing and engineering technology. Simultaneously, the advent of online shopping has revolutionized how consumers access and purchase cosmetic products. In this dynamic landscape, the concept of "modern personalized cosmetics" has emerged as a focal point, offering consumers tailored beauty solutions that cater to their unique needs and preferences [1]. Understanding the factors that influence online shoppers' attitudes and purchase intentions towards these modern personalized cosmetics is vital for both cosmetics brands and digital marketers. This study delves into

the multifaceted realm of online cosmetics shopping in the digital age, shedding light on the critical role played by online advertising and promotion, as well as the impact of manufacturing and engineering technology on cosmetic products. The cosmetics industry is experiencing a profound metamorphosis, fueled by advancements in manufacturing and engineering technology. Simultaneously, the advent of online shopping has revolutionized consumer access to and purchasing of cosmetic products. Within this dynamic landscape, "modern personalized cosmetics" has emerged as a focal point, offering consumers tailor-made beauty solutions that cater to their unique preferences and needs. This study embarks on an exploration of online cosmetics shopping in the digital age, with a specific focus on discerning the factors that influence online shoppers' attitudes and purchase intentions towards these modern personalized cosmetics [15]. The digital age has ushered in transformative changes across various industries, and cosmetics is no exception. The rise of e-commerce has empowered consumers to navigate a global marketplace with unparalleled convenience, reshaping the way they interact with beauty products. Female online shoppers in Thailand, mirroring global trends, are increasingly turning to the digital realm to explore and procure personalized cosmetics. This seismic shift presents both opportunities and challenges for cosmetics brands seeking to engage their target audience effectively and thrive in this competitive landscape [17]. In this digital era, the efficacy of online marketing and the impact of manufacturing and engineering technology on cosmetic products are at the forefront of industry considerations. Online advertising and promotion, across various digital channels, are instrumental in introducing consumers to personalized cosmetic offerings and shaping their attitudes and purchase intentions. Concurrently, advancements in manufacturing and engineering technology are enabling the creation of customized beauty products at scale, responding to the demand for unique beauty experiences. This study endeavors to elucidate how these factors interact and influence the ever-evolving cosmetics market in Thailand [4-5]. The beauty industry has entered an era where personalization is at the forefront. Modern consumers seek cosmetics that resonate with their individual identities, skin types, and style preferences. Personalized cosmetics encompass a range of products, from custom-blended foundations to skincare regimens tailored to specific skin concerns. This trend has been bolstered by advancements in cosmetic manufacturing and engineering technology, which enable the creation of bespoke beauty products on a larger scale. Consequently, cosmetics companies are increasingly investing in technology-driven solutions to meet the growing demand for personalized beauty experiences. [8]. The digital revolution has reshaped the retail landscape, and the cosmetics industry has not remained immune to its effects. Online shopping has provided consumers with unprecedented convenience, access to a global marketplace, and a wealth of information at their fingertips. Female online shoppers in Thailand, like their counterparts worldwide, are embracing the digital realm to explore and purchase personalized cosmetics. This shift has created new opportunities and challenges for cosmetics brands seeking to engage with their target audience effectively. [10] In this digital era, online advertising and promotion play pivotal roles in shaping consumer perceptions and purchase behaviors. The ability to reach a vast audience through various online channels, including social media, influencers, and e-commerce platforms, has made it essential for cosmetics brands to employ effective digital marketing strategies. Online advertising and promotion not only introduce consumers to personalized cosmetic offerings but also shape their attitudes and intentions to make purchases. Understanding how these strategies influence consumers' trust, e-WOM, attitudes, and purchase intentions regarding modern personalized cosmetics is the primary focus of this study. Gender-specific segmentation presents businesses with valuable opportunities to enhance their products and services. This research focuses on key areas within gender-based marketing segmentation, particularly within the context of online cosmetics consumers. Studies [1] emphasize the importance of considering gender and age as essential components when segmenting markets. Many beauty brands have recognized the potential of gender-specific marketing to innovate and optimize their marketing campaigns. While most promotion strategies have traditionally targeted women and their everyday needs, there is a growing recognition that a male-specific marketing strategy could yield significant benefits. Studies [2, 3] have noted that men tend to exhibit a stronger interest in computer technology, making the internet a prime platform for reaching male consumers. Additionally, research [4, 5] has pointed out that males are increasingly embracing various grooming practices that were traditionally associated with femininity. Consequently, marketers need to segment and understand the distinct ways in which men

and women approach their purchasing decisions in order to develop more effective marketing strategies. This suggests that while there may be similarities in retail shopping behaviors between genders, there are also notable differences. Regarding gender and its connection to cosmetics, it is expected that both male and female consumers exhibit a considerable interest in cosmetic products [6-8]. Cosmetic products are frequently used to enhance one's appearance and achieve desired looks, leading to questions about purchase intentions among both male and female consumers. This study aims to shed light on the purchase intentions of male and female online consumers in Thailand and examine how these intentions relate to factors that theoretically influence purchasing behavior [9-11]. The overarching theme of this research is to explore the expanding trend of online purchases of personalized cosmetic products. It seeks to provide a comprehensive overview of the increasing demand for personalized cosmetics and the need for specific insights into online consumers' cosmetic purchase intentions. This article also aims to identify the significant impact of perceived value and trust on consumers' online purchase intentions for personalized cosmetics. Furthermore, it seeks to determine the relationship between brand image and trust in estimating consumers' online purchase intentions for personalized cosmetics.

LITERATURE REVIEW

In the past, models of mass production and the prevailing notion of standardization, driven by the pursuit of productivity, dominated the landscape of commerce. This approach was characterized by a one-size-fits-all mentality that aimed to maximize the influence on purchase decisions for standardized items among shoppers. However, forward-thinking marketers seeking to stand out and connect with consumers on a deeper and more precise level began to employ a different strategy. This marked a gradual shift in marketing philosophy from the traditional models of mass marketing and market segmentation to more nuanced approaches like niche marketing, micro-marketing, mass customization, and eventually personalization. "Personalization" lies at the core of this evolving marketing paradigm. It involves tailoring goods and services to meet the unique requirements and demands of individual shoppers, in stark contrast to the one-size-fits-all approach. From a commercial perspective, personalization became practical as it allowed businesses to engage potential buyers by reducing the number of irrelevant marketing efforts. Moreover, previous research has highlighted several advantages that personalization offers to marketers, including higher returns on their intangible assets, increased response rates, the cultivation of loyal customers, differentiation from competitors, and enhanced bargaining power. Essentially, personalized marketing communication has consistently proven to be the "strategic key to success," particularly in the realm of digital marketing. Previous studies have largely emphasized that customization has the potential to shape customers' purchasing attitudes and behaviors by aligning with individual preferences, addressing unique needs, fostering a sense of accomplishment, evoking emotional ownership, and ultimately increasing perceived value. In the digital era, "digital marketing" has emerged as a crucial enabler of personalization, allowing businesses to leverage data-driven insights and technology to create tailored marketing experiences that resonate with individual consumers. This fusion of personalization and digital marketing represents a powerful strategy for engaging and satisfying today's discerning and tech-savvy consumers.

Business Model of Online Personalize Cosmetic

The process of creating personalized products begins with a deep understanding and interpretation of the customer's needs and preferences. Researchers like Purwanti and Triyuwono [12] have explored the relationship between product involvement (how engaged a consumer is with a product category) and the expression of the client's feelings, thoughts, and ideas, particularly in the context of online personalized product customization. Their findings indicate that the level of consumer interest and effort invested in a product or brand significantly impacts their intention to customize products. This customization process typically involves customers making selections and answering questions through a website system to address their specific needs and concerns [13-16]. Depending on factors like allergies, sensitivities, appearance preferences, and individual responses, the website then selects ingredients to be mixed and matched in the product base. Customers are provided with a base product that can be further modified, including adjustments to scent, color, tone, and minor ingredient variations.

Experimental studies have consistently shown that personalization can significantly influence consumers' purchasing behaviors, as it incorporates personal favorites, unique requirements, a sense of achievement, emotional ownership, and an increased perceived value [20].

Tailoring Products to Customer Preferences:
Once customers have selected their base product, they are provided with options to customize it further. This customization may involve altering ingredient combinations to meet specific preferences. The final product is characterized by the brand, ensuring that it aligns with the customer's preferences. An essential aspect of this process is the use of algorithms to understand and cater to individual customer preferences [14-16, 21]. The customization of products based on the unique preferences and needs of each customer has become a central focus in the creation of personalized products. This approach not only allows customers to receive products that align with their personal tastes but also enhances their sense of ownership and satisfaction.

The Power of Personalization in Consumer Behavior:
The integration of personalization into product creation and marketing strategies has a profound impact on consumer behavior. By catering to individual preferences, unique requirements, and a sense of achievement, businesses are able to influence how consumers perceive and interact with their products. Experimental research consistently demonstrates that personalization can lead to modifications in consumers' purchasing behaviors and actions. It fosters a sense of connection between the consumer and the product, ultimately resulting in greater perceived value and satisfaction [20]. This approach acknowledges that consumers are not homogenous and that tailoring products to individual preferences is a key driver in today's market.

As the digital marketplace continues to innovate, online commerce environments are evolving in tandem. They offer consumers an array of choices within the retail landscape, providing value-added services and products. In reality, personalization strategies extend beyond the online realm to influence consumer behavior and enhance brand awareness, both offline and online [22]. These strategies are often indicative of a business's commitment to delivering tailored experiences that resonate with individual customers [23]. The ability to understand customer preferences and create personalized features has become a highly effective approach in marketing, directing marketing efforts towards each customer [22]. Consumers are increasingly seeking customized products, prompting brands in the retail sector to establish a robust digital presence. Online retail is reshaping the traditional shopping experience and the products available in physical stores. To remain relevant, brands are embracing product customization, which has significant implications for the retail industry.

Ultimately, the goal is to provide customers with a personalized experience. Given the limited presence of such startups in the cosmetics industry, personalized cosmetic products represent an intelligent opportunity. This business model caters to a broad market segment seeking products designed or created by the customer.

Cosmetics rank among the top-selling consumer products [24]. Consumer research estimates suggest that the men's cosmetic markets in the US and Europe were expected to grow from $31.5 billion in 2003 to $37.6 billion in 2008 [25, 26]. According to a study conducted by L'Oréal, a key player in the beauty industry, in 1990, only four percent of men admitted to regularly using cosmetic products, a number that rose to 21 percent by 2001. It was projected to reach 50 percent by 2015. Consequently, females often exhibited greater sensitivity to communication fundamentals when making decisions compared to males [27]. Despite the beauty industry historically being female-dominated, there was a growing demand for cosmetics among men. The male niche beauty retail sector was expanding rapidly and becoming increasingly significant for industry entrepreneurs. Specific products were developed to cater to the needs of distinct sensibilities, leading to significant benefits through market segmentation. This approach allowed companies to target niche markets, expand market share, and enhance efficiency. The cosmetic industry has witnessed remarkable growth over the years, representing one of the industries

with the highest potential for further development and progress. Consumer behavior encompasses the acquisition, consumption, and procurement of goods and services for personal use, shaped by decision-making processes and underlying principles [28]. Consumer buying behavior reflects how customers act when choosing products to fulfill their needs. Both men and women can be part of a concentrated market for a particular product, but it is also possible that the communication strategy for one gender may differ from that of another gender within the firm's target audience. Markets can adapt their product offerings to cater to the demands of a specific gender while acknowledging the concept of gender segmentation. The Role of Digital Marketing: In this evolving landscape, digital marketing plays a pivotal role. It enables businesses to personalize their marketing efforts online, delivering tailored content, product recommendations, and experiences to individual consumers. Digital marketing strategies, such as targeted advertising and personalized email campaigns, allow brands to engage with their audience in a way that resonates with their preferences and behaviors. Furthermore, digital marketing platforms provide valuable data insights that help businesses better understand consumer behavior, refine their strategies, and optimize their product offerings. In the cosmetics industry, digital marketing has become an essential tool for reaching both male and female consumers, capitalizing on the growing demand for personalized beauty products. This digital transformation is reshaping the industry and driving its continuous growth and evolution.

RESEARCH METHODOLOGY

Respondents and Sampling Procedure

Sampling is a crucial step in research and involves selecting a subset of items or individuals from a larger target population to draw conclusions about the entire population. It's essential to define the population of interest before choosing a sampling technique [11]. The process of sampling entails a systematic selection of smaller segments of a population that represent the whole population, with the aim of gathering information about a specific aspect of interest. A sample is essentially a subset drawn from the larger population, carefully chosen to participate in a study. There are two primary approaches to sampling. The first approach involves creating probability samples, where the probability of being selected to provide information for a survey or questionnaire is known and determined. This method ensures that each member of the population has a known and nonzero chance of being included in the sample [29]. In contrast, the second approach involves non-probability samples, where the probability of selection is not specified. Non-probability sampling methods are modified and adapted to identify relevant sampling units for a study. These methods do not guarantee that each member of the population has a known probability of being selected, which distinguishes them from probability sampling methods.

Sampling

Song, Guo [30] mentioned that the sampling unit was predilections of special application fundamentals of a population, and investigators consider that regarding sampling units possibly will ran through to signify the totality population. Additionally, Kirby, Adgerson [29] stated that the sampling unit is the foundation unit operated to create a sample. Sampling units possibly will be described as a singular or collection of individuals in relation of fundamentals in support of population. Predominantly of this study concentrated on the clearly defined fundamentals of purchase intention. Beos, Kemps [31] precisely marked the sampling unit as a component also things that were able to be used or obtained for carefully choose as being the best or most suitable from the target population for the research. Bonell, Austen [32] detailed that the sampling unit was a unique component or a collection component and also comprised in the study.

Sample Size

In terms of sample size, according to Henderson-King and Henderson-King [37], a consumer review study should ideally encompass between 200 to 500 responses. Hustad and Malmqvist [38] have suggested that 'rules of thumb' for sample sizes larger than 30 and smaller than 500 are appropriate in cases of extensive research studies.

In this study, the anticipated effect size was set at 0.2, the desired statistical power level at 0.8, with 9 latent variables and 37 observed variables. The significance level was chosen at 0.05. The minimum sample size required to detect the desired effect was 460, while the minimum sample size for modeling the structural relationships was 92. The recommended minimum sample size was 46. To ensure robust statistical analysis, the researcher chose a sample size of 500 for each group, totaling 1,000 samples.

The study's target population consisted of female online consumers who met the following criteria: they had been members of Facebook for more than a year and were part of Facebook cosmetics fan pages. In addition, stratified sampling was employed to categorize participants into three distinct groups based on the top three cosmetic brands in Thailand for 2021:

L'OREAL (LOR), Lancome (LAN), Maybelline (MBL)

Furthermore, the questionnaire was distributed to consumers who had used products from these top three brands over the past year.

In the context of modern research, it's essential to recognize the significant role of digital marketing in shaping consumer behavior and preferences

Cronbach's Alpha Reliability

Cronbach's alpha was applied preference in the direction of reliable coefficient to calculate approximately the inner feature stability for the signal that shows genuinely. In this investigate sampled 30 respondents, that was valued to be an adequate amount to test Cronbach's alpha. Additionally, Cronbach's alpha reliability was put into practical use as opposed by being theoretical in a pilot test to prove the truth about the reliability from each item's conformation of perceived valued, brand image, product attitude, brand attitude, need for uniqueness, trust, E-WOM, attitude toward online shopping and online purchase intention. In support of lately developed instrument, measuring devices were agreed to take when the significance of alpha was upper than .6. [16, 18]

RESULT

Table 1 The Recommended Levels for Representing an Acceptable Model Fit for Goodness-of-Fit Measures.

Index	Acceptable Values	Description	Source
CMIN/DF	< 3.00	Value must be less than 3	Hair et al. (2006)
GFI	greater than or equal to.85	A value of .85 or above is required for an appropriate match.	Hair et al. (2006)
AGFI	greater than or equal to.85	A value of .85 or above is required for an appropriate match.	Hair et al. (2006)
NFI	greater than or equal to.85	A value of .85 or above is required for an appropriate match.	Hair et al. (2006)
CFI	greater than or equal to.85	A value of .85 or above is required for an appropriate match.	Hair et al. (2006)
TLI	greater than or equal to.85	A value of .85 or above is required for an appropriate match.	Hair et al. (2006)
IFI	greater than or equal to.85	A value of .85 or above is required for an appropriate match.	Hair et al. (2006)
RMSEA	≤ .05	Value must be equal or less than .05, it indicates good fit	Hair et al. (2006)

For structural measurements and modeling, the commonly used Good-of-fit (GoF) test should be applied. SEM employed Chi-square X2, which was the squared tolerance of values, to see if the model fit the data. The root means square error (RMSEA), the good index (GFI), the adjusted fitness index

(AGFI), the benchmark suitability index (CFI), the normative fitness index (NFI), and the tucker-lewis index (TLI). Sample size and data dispersion impacted several GoF measurements [41-47].

Confirmatory Factor Analysis (CFA)

Table 2 Goodness of Fit for Measurement Model

Index	Acceptable Values	Statistical Values
CMIN/DF	< 3.00 [48]	891.547/593 = 1.503
GFI	greater than or equal to .85[49]	.914
AGFI	greater than or equal to .85 [47]	.898
NFI	greater than or equal to .85 [46]	.905
CFI	greater than or equal to .85 [45]	.966
TLI	greater than or equal to .85 [50]	.962
IFI	greater than or equal to .85 [51]	.966
RMSEA	≤ .05 [52]	.032
Model summary		**Acceptable Model Fit**

* CMIN/DF: This represents the ratio of the chi-square value to the degree of freedom. GFI (Goodness-of-Fit Index): This index assesses the goodness of fit of a statistical model. AGFI (Adjusted Goodness-of-Fit Index): This is a modified version of GFI that considers the model's degrees of freedom. NFI (Normalized Fit Index): NFI measures how well the model fits the data compared to a baseline model. CFI (Comparative Fit Index): CFI compares the model's fit to a null model with no relationships between variables. TLI (Tucker-Lewis Index): TLI evaluates the improvement in fit compared to a baseline model. IFI (Incremental Fit Index): IFI is another index that assesses incremental fit. RMSEA (Root Mean Square Error of Approximation): RMSEA measures the discrepancy between the model's predictions and the observed data, accounting for model complexity.

Table 3 Discriminant Validity

	T	PV	BI	AP	AB	UNI	EWOM	PI	AO
T	**.688**								
PV	.268	**.724**							
BI	.313	.538	**.852**						
AP	.295	.525	.542	**.702**					
AB	.170	.407	.429	.277	**.702**				
UNI	.287	.622	.651	.530	.628	**.686**			
EWOM	.217	.648	.648	.621	.342	.605	**.709**		
PI	.256	.421	.730	.502	.372	.621	.574	**.844**	
AO	.262	.612	.593	.579	.440	.620	.528	.485	**.685**

Assessment of Discriminant Validity: As reported by Barney and Barrett [53], the evaluation of discriminant validity involved the calculation of the square root of the Average Variance Extracted (AVE) for each construct. Discriminant validity is a statistical principle utilized to ensure that different constructs or factors under examination in a study are indeed distinguishable from one another. When the AVE for a specific construct exceeds the squared correlations between that construct and all other constructs, it provides evidence that the construct is distinct from the others. This observation in your text suggests that the AVE values in the study fulfilled this criterion, thereby supporting the presence of discriminant validity among the constructs being investigated.

Multicollinearity: A problem in statistical analysis when two or more independent variables in a regression model are highly correlated with each other. This can lead to problems in interpreting the effects of individual variables. To check for multicollinearity, the correlation coefficient between

independent variables is examined. If the correlation coefficients are high (typically above .80), it can indicate multicollinearity, which can be problematic for statistical analysis. However, in your passage, it is stated that the factor correlations in Table 7 did not surpass .80, suggesting that multicollinearity is not an issue in this study [54].

Structural Equation Model (SEM)

Table 4 Goodness of Fit for Structural Model before Adjustment

Index	**Acceptable Values**	**Statistical Values Before Adjustment**
CMIN/DF	< 3.00 (Hair et al., 2006)	228.994/619 = 3.685
GFI	greater than or equal to .85 (Hair et al., 2006)	.810
AGFI	greater than or equal to .85 (Hair et al., 2006)	.782
NFI	greater than or equal to .85 (Hair et al., 2006)	.769
CFI	greater than or equal to .85 (Hair et al., 2006)	.822
TLI	greater than or equal to .85 (Hair et al., 2006)	.807
IFI	greater than or equal to .85 (Hair et al., 2006)	.823
RMSEA	greater than or equal to .05 (Pedroso et al., 2016)	.085
Summary		**Unacceptable Model Fit**

Table 5 Goodness of Fit for Structural Model before and after Adjustment

Index	**Acceptable Values**	**Statistical Values Before Adjustment**	**Statistical Values After Adjustment**
CMIN/DF	< 3.00 (Hair et al., 2006)	228.994/619 = 3.685	1299.612/606 = 2.145
GFI	greater than or equal to.85	.812	.897
AGFI	greater than or equal to.85	.784	.878
NFI	greater than or equal to.85	.771	.876
CFI	greater than or equal to.85	.824	.935
TLI	greater than or equal to.85	.809	.927
IFI	greater than or equal to.85	.825	.935
RMSEA	≤ .05 (Pedroso et al., 2016)	.087	.062
Summary		**Unacceptable Model Fit**	**Acceptable Model Fit**

Table 6 Hypotheses Result of the Structural Model

Hypothesis	**Standardized coefficient (β)**	**t-value**	**Test result**
H1: Perceived Value has significant impact on Trust	.1442	1.8662	**Not Supported**
H2: Brand Image has significant impact on Trust	.2872	4.008*	**Supported**
H3: Product Attitude has significant impact on E-WOM	.6322	9.717*	**Supported**

Hypothesis	Standardized coefficient (β)	t-value	Test result
H4: Brand Attitude has significant impact on E-WOM	.3142	4.422*	**Supported**
H5: Need of Uniqueness has significant impact on Attitude toward Online Shopping	.7322	1.022*	**Supported**
H6: Trust has significant impact on Online Purchase Intention	.1092	3.041*	**Supported**
H7: E-WOM has significant impact on Online Purchase Intention	.2142	3.653*	**Supported**
H8: Product Attitude has significant impact on Online Purchase Intention	.3942	4.133*	**Supported**
H9: Brand Attitude has significant impact on Online Purchase Intention	.4062	3.698*	**Supported**
H10: Attitude toward Online Shopping has significant impact on Online Purchase Intention	-.077	-1.461	**Not Supported**

Note: *=p-value<.05

Table 7 Direct (DE), Indirect (IE) and Total Effects (TE) of Relationships

	Dependent Variables							
Independent Variable	Attitude toward Online Shopping (AO)				E-WOM (EWOM)			
	DE	IE	TE	R^2	DE	IE	TE	R^2
Need of Uniqueness (UNI)	.662*	-	.662*	.506	-	-	-	.552
Brand Attitude (AB)	-	-	-		.237*	-	.237*	
Product Attitude (AP)	-	-	-		.611*	-	.611*	
Brand Image (BI)	-	-	-		-	-	-	
Perceived Value (PV)	-	-	-		-	-	-	
Attitude toward Online Shopping (AO)	-	-	-		-	-	-	
E-WOM (EWOM)	-	-	-		-	-	-	
Trust (T)	-	-	-		-	-	-	
	Trust (T)				Online Purchase Intention (PI)			
	DE	IE	TE	R^2	DE	IE	TE	R^2
Need of Uniqueness (UNI)	-	-	-	.121	-	-.062*	-.062*	.535
Brand Attitude (AB)	-	-	-		.385*	.057*	.441*	
Product Attitude (AP)	-	-	-		.373*	.118*	.491*	
Brand Image (BI)	.266*	-	.266*		-	.023*	.023*	
Perceived Value (PV)	.123	-	.123		-	.011	.011	
Attitude toward Online Shopping (AO)	-	-	-		-.087	-	-.087	
E-WOM (EWOM)	-	-	-		.193*	-	.193*	
Trust (T)	-	-	-		.088*	-	.088*	

Note: *=p-value<.05

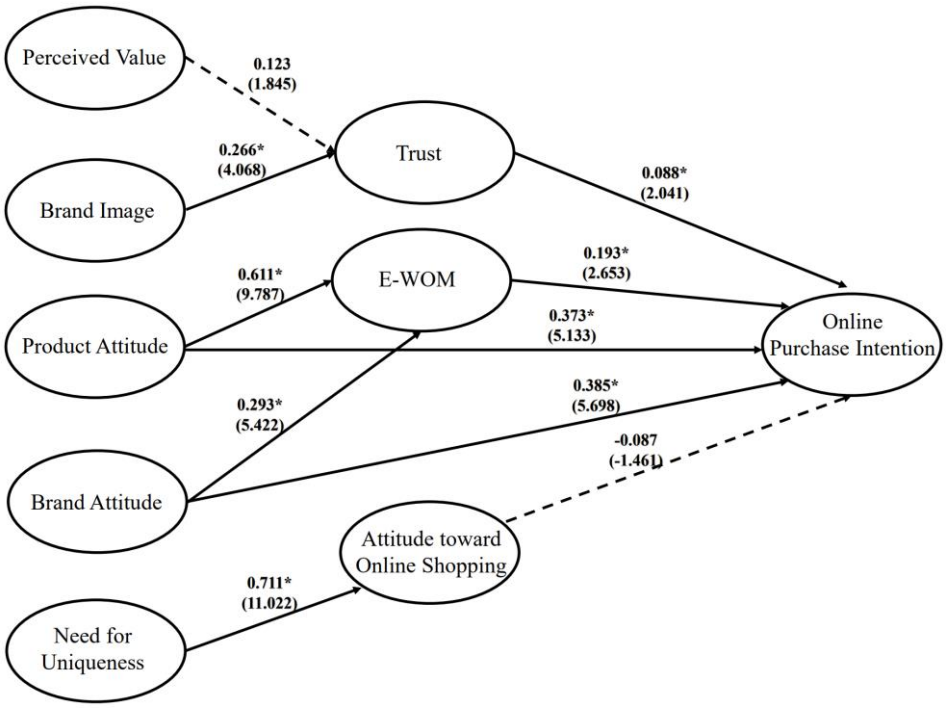

Figure 1 The Results of Structural Model

CONCLUSION

Market Trends in Thailand's Beauty and Personal Care Industry [52-54]:

The study uncovered notable market trends within Thailand's beauty and personal care sector. The widespread use of social media has significantly impacted the industry, offering both opportunities and challenges. Social media platforms enable businesses to target specific customer segments more effectively. Respondents in a focus group revealed that they often discover new beauty brands and products through social media, placing high importance on positive user reviews. While skin whitening products have historically been popular in Thailand, a shift in public opinion and concerns about the safety of ingredients has sparked a backlash against this product category. To cater to today's more discerning Thai consumers, companies are adapting by ensuring their skincare products are composed of safe, natural ingredients and providing detailed explanations of these elements. Transparency is becoming increasingly important, with brands like Lush adopting a more open approach, including product photographs, videos, descriptions, and ingredient lists. Dermatologist- and physician-formulated skincare products are also in demand, often commanding higher prices due to their use of advanced manufacturing technologies. As a result, masstige derma brands have emerged, targeting health-conscious consumers willing to invest in higher-quality skincare. [28-30] Impact of Brand Image, Attitudes, and Trust on Online Purchase Intention: [31-35] The study's structural model results confirm several hypotheses regarding the impact of various factors on online purchase intention among Thai female consumers of personalized cosmetics. Brand image was found to significantly influence trust, while product attitude had a significant impact on electronic word-of-mouth (E-WOM). Brand attitude also played a significant role in influencing E-WOM. The need for uniqueness was found to impact consumers' attitudes toward online shopping, and trust was identified as a significant factor affecting online purchase intention [40]. This aligns with prior research by Yang (2018), Doszhanov and Ahmad (2015), and Lhawonk (2014). Additionally, E-WOM was found to have a significant impact on online purchase intention, highlighting the importance of word-of-mouth communication in influencing consumers' intentions to purchase personalized cosmetics online. Both product attitude and brand attitude were identified as significant factors influencing online purchase intention.

Engineering technology plays a significant role in the cosmetics industry, contributing to product development, manufacturing processes, quality control, and more. Here are several ways in which

engineering technology is applied in the cosmetics field: Product Formulation and Development: Engineers work alongside cosmetic chemists to design and formulate new cosmetic products. They use their expertise in materials science and chemistry to select and test ingredients, ensuring products meet safety and performance standards. Ingredient Testing and Quality Control: Advanced testing and measurement technologies are employed to evaluate the safety, efficacy, and quality of cosmetic ingredients. This includes techniques like spectroscopy, chromatography, and microscopy. Packaging and Dispensing Systems: Engineers design innovative packaging solutions to enhance product functionality, aesthetics, and user experience. They also create efficient dispensing systems to control product dosage and minimize waste. Manufacturing and Automation: Automation and robotics are used in cosmetic manufacturing to improve efficiency, precision, and consistency. Engineers design and maintain production lines and equipment, ensuring high-quality products are produced at scale. Sustainability and Environmental Impact: Engineers play a crucial role in developing sustainable practices within the cosmetics industry. This includes designing eco-friendly packaging, optimizing manufacturing processes to reduce waste and energy consumption, and exploring green chemistry alternatives. Cosmetic Devices and Tools: Engineering technology is used to design and manufacture cosmetic devices and tools such as automated skincare devices, hair styling tools, and application brushes. Testing and Safety: Engineers develop and utilize testing equipment to assess the safety of cosmetics, including stability testing, microbial testing, and compatibility testing to ensure products are safe for consumers. Supply Chain and Logistics: Technology is employed to optimize supply chain operations, from raw material sourcing to distribution, ensuring timely and efficient delivery of cosmetic products to consumers. Data Analytics and Consumer Insights: Advanced data analytics and machine learning are used to analyze consumer behavior, trends, and preferences. This information helps cosmetics companies tailor their product offerings and marketing strategies. Regulatory Compliance: Engineers work with regulatory experts to ensure that cosmetic products comply with local and international regulations. They are involved in documentation, testing, and reporting to meet safety and labeling requirements. Recommendations for Entrepreneurs in the Beauty Industry: [36-42] Based on the elements influencing the purchasing decisions of new cosmetic brands in the online skincare sector, there are key recommendations for entrepreneurs seeking to establish trust and confidence among consumers. These recommendations include enhancing consumer understanding of products, improving consumer perception of product quality and pricing, aligning with consumer needs, adopting effective online distribution strategies, and utilizing comprehensive online advertising across various channels. By addressing these aspects, entrepreneurs can bolster consumer confidence in their products, foster a deeper understanding of their offerings, and enhance the overall perception of their brand, ultimately contributing to increased sales and market success in the online skincare sector.

REFERENCES

1. Aslam, A., et al., *Algae as an attractive source for cosmetics to counter environmental stress.* Sci Total Environ, 2021. **772**: p. 144905.
2. Barbaud, A. and C. Lafforgue, *Risks associated with cosmetic ingredients.* Ann Dermatol Venereol, 2021. **148**(2): p. 77-93.
3. Deng, L., et al., *Microplastics in personal care products: Exploring public intention of usage by extending the theory of planned behaviour.* Sci Total Environ, 2022: p. 157782.
4. Duche, G., P. Thordarson, and M. Kearnes, *The importance of reflecting on treatment and post-treatment care when assessing the social aspects of cosmetic nanomedicine and transdermal delivery system.* Nanomedicine, 202. **28**: p. 102214.
5. Ghazali, E., et al., *Health and cosmetics: Investigating consumers' values for buying organic personal care products.* Journal of Retailing and Consumer Services, 2017. **39**: p. 154-163.
6. Kidd, T., et al., *Attitudes, Influences and Perceptions towards Plastic Surgery amongst Medical Students.* JPRAS Open, 2021. **29**: p. 167-177.
7. Kitano, T., *Development of Cosmetics and Intellectual Property Rights*, in *Cosmetic Science and Technology*. 2017. p. 121-136.

8. Kolling, C., J.L.D. Ribeiro, and J.F. de Medeiros, *Performance of the cosmetics industry from the perspective of Corporate Social Responsibility and Design for Sustainability.* Sustainable Production and Consumption, 2022. **30**: p. 171-185.
9. Liobikienė, G. and J. Bernatonienė, *Why determinants of green purchase cannot be treated equally? The case of green cosmetics: Literature review.* Journal of Cleaner Production, 2017. **162**: p. 109-12.
10. Marque, C., A.-M. Pensé-Lhéritier, and I. Bacle, *Sensory methods for cosmetics evaluation*, in *Nonfood Sesory Practices*. 2022. p. 169-196.
11. Nawalage, N.S.K. and B.K.A. Bellanthudawa, *Synthetic polymers in personal care and cosmetics products (PCCPs) as a source of microplastic (MP) pollution.* Mar Pollut Bull, 2022. **182**: p. 113927.
12. Purwanti, L., et al., *Cosmetics and Tricks: Representing the Meanings of Earning Management Practices.* Procedia - Social and Behavioral Sciences, 2015. **211**: p. 704-71.
13. Nicolas, S.C.A. and L.L.M. Welling, *Women's acceptance of cosmetic surgery across the menstrual cycle.* Personality and Individual Differences, 2017. **115**: p. 99-102.
14. Seekis, V. and G. Barker, *Does #beauty have a dark side? Testing mediating pathways between engagement with beauty content on social media and cosmetic surgery consideration.* Body Image, 2022. **42**: p. 268-275.
15. Sharp, G., M. Tiggemann, and J. Mattiske, *The role of media and peer influences in Australian women's attitudes towards cosmetic surgery.* Body Image, 2014. **11**(4): p. 482-7.
16. Stefanile, C., A. Nerini, and C. Matera, *The factor structure and psychometric properties of the Italian version of the Acceptance of Cosmetic Surgery Scale.* Body Image, 2014. **11**(4): p. 370-9.
17. Wojtkowska, A., et al., *The effect of cosmetic surgery on mental self-image and life satisfaction in women undergoing breast augmentation: An intermediate role of evaluating the surgery as one of the most important life events.* J Plast Reconstr Aesthet Surg, 2022. **75**(6): p. 1842-1848.
18. Wu, Y., J.M. Alleva, and S. Mulkens, *Factor Analysis and Psychometric Properties of the Chinese Translation of the Acceptance of Cosmetic Surgery Scale.* Body Image, 202. **33**: p. 244-256.
19. Wu, Y., S. Mulkens, and J.M. Alleva, *Body image and acceptance of cosmetic surgery in China and the Netherlands: A qualitative study on cultural differences and similarities.* Body Image, 2022. **40**: p. 30-49.
20. Rieder, B.O., *Consumer exposure to certain ingredients of cosmetic products: The case for tea tree oil.* Food Chem Toxicol, 2017. **108**(Pt A): p. 326-338.
21. Swami, V., *Translation and validation of the Malay Acceptance of Cosmetic Surgery Scale.* Body Image, 201. **7**(4): p. 372-5.
22. Waldman, A., J.F. Sobanko, and M. Alam, *Practice and Educational Gaps in Cosmetic Dermatologic Surgery.* Dermatol Clin, 2016. **34**(3): p. 341-6.
23. Yeo, B.L., R.H.N. Mohamed, and M. Muda, *A Study of Malaysian Customers Purchase Motivation of Halal Cosmetics Retail Products: Examining Theory of Consumption Value and Customer Satisfaction.* Procedia Economics and Finance, 2016. **37**: p. 176-182.
24. Abe, T., *Psychology of Cosmetic Behavior*, in *Cosmetic Science and Technology*. 2017. p. 101-113.
25. Ajitha, S. and V.J. Sivakumar, *Understanding the effect of personal and social value on attitude and usage behavior of luxury cosmetic brands.* Journal of Retailing and Consumer Services, 2017. **39**: p. 103-113.
26. Bakkar, M.M. and E.A. Alzghoul, *Assessment of contact lens wearers' attitude toward contact lens wear and care during Coronavirus Disease 2019 (COVID-19) pandemic: A cross-sectional online survey.* Cont Lens Anterior Eye, 2021. **44**(6): p. 10141.
27. Erdoğmuş, İ.E. and M. Çiçek, *The Impact of Social Media Marketing on Brand Loyalty.* Procedia - Social and Behavioral Sciences, 2012. **58**: p. 1353-136.
28. Godey, B., et al., *Social media marketing efforts of luxury brands: Influence on brand equity and consumer behavior.* Journal of Business Research, 2016. **69**(12): p. 5833-5841.

29. Kirby, J.S., C.N. Adgerson, and B.E. Anderson, *A survey of dermatology resident education in cosmetic procedures.* J Am Acad Dermatol, 2013. **68**(2): p. e23-8.
30. Song, Y., S. Guo, and M. Zhang, *Assessing customers' perceived value of the anti-haze cosmetics under haze pollution.* Sci Total Environ, 2019. **685**: p. 753-762.
31. Beos, N., E. Kemps, and I. Prichard, *Photo manipulation as a predictor of facial dissatisfaction and cosmetic procedure attitudes.* Body Image, 2021. **39**: p. 194-201.
32. Bonell, S., E. Austen, and S. Griffiths, *Australian women's motivations for, and experiences of, cosmetic surgery: A qualitative investigation.* Body Image, 2022. **41**: p. 128-139.
33. Bonell, S., F.K. Barlow, and S. Griffiths, *The cosmetic surgery paradox: Toward a contemporary understanding of cosmetic surgery popularisation and attitudes.* Body Image, 2021. **38**: p. 230-24.
34. Carracedo, P., R. Puertas, and L. Marti, *Research lines on the impact of the COVID-19 pandemic on business. A text mining analysis.* J Bus Res, 2021. **132**: p. 586-593.
35. Coughlin, J.W., et al., *Cosmetic surgery in inpatients with eating disorders: attitudes and experience.* Body Image, 2012. **9**(1): p. 180-3.
36. Hashim, A.J.b.C.M. and R. Musa, *Factors Influencing Attitude towards Halal Cosmetic among Young Adult Urban Muslim Women: A Focus Group Analysis.* Procedia - Social and Behavioral Sciences, 2014. **130**: p. 129-134.
37. Henderson-King, D. and E. Henderson-King, *Acceptance of cosmetic surgery: scale development and validation.* Body Image, 2005. **2**(2): p. 137-49.
38. Hustad, I.B., et al., *Does Size Matter? Genital Self-Image, Genital Size, Pornography Use and Openness Toward Cosmetic Genital Surgery in 3503 Swedish Men and Women.* J Sex Med, 2022. **19**(9): p. 1378-1386.
39. Mazzeo, S.E., et al., *Effects of a reality TV cosmetic surgery makeover program on eating disordered attitudes and behaviors.* Eat Behav, 2007. **8**(3): p. 390-7.
40. Yang, R. and T. Che, *Do social ties matter for purchase frequency? The role of buyers' attitude towards social media marketing.* Computers in Human Behavior, 202. **11.**
41. Hanghon, P. and I. Rinthaisong, *Confirmatory factor analysis of collaboration model in non-formal higher education management in southern Thailand.* Kasetsart Journal of Social Sciences, 2018. **39**(3): p. 472-477.
42. Harerimana, A. and N.G. Mtshali, *Using Exploratory and Confirmatory Factor Analysis to understand the role of technology in nursing education.* Nurse Educ Today, 202. **92**: p. 10449.
43. Heiss, S., C.A. Timko, and J.M. Hormes, *Confirmatory factor analysis of the EDE-Q in vegans and omnivores: Support for the brief three factor model.* Eat Behav, 202. **39**: p. 101447.
44. Helsen, K., et al., *Confirmatory factor analysis of the Dutch Intolerance of Uncertainty Scale: Comparison of the full and short version.* J Behav Ther Exp Psychiatry, 2013. **44**(1): p. 21-9.
45. Hevey, D., et al., *Consideration of future consequences scale: Confirmatory Factor Analysis.* Personality and Individual Differences, 201. **48**(5): p. 654-657.
46. Hicks, R.E., M. Bahr, and D. Fujiwara, *The Occupational Stress Inventory-Revised: Confirmatory factor analysis of the original inter-correlation data set and model.* Personality and Individual Differences, 201. **48**(3): p. 351-353.
47. Javelle, F., et al., *The German Three Factor Impulsivity Index: Confirmatory factor analysis and ties to demographic and health-related variables.* Pers Individ Dif, 2021. **171**.
48. Hair, J.F., et al., *Executing and interpreting applications of PLS-SEM: Updates for family business researchers.* Journal of Family Business Strategy, 2021. **12**(3).
49. Ricketts, E.J., et al., *Confirmatory factor analysis of the SLEEP-50 Questionnaire in Trichotillomania (Hair-Pulling Disorder) and Excoriation (Skin-Picking) Disorder.* Psychiatry Res, 2019. **273**: p. 197-205.
50. Basco, R., et al., *Advancing family business research through modeling nonlinear relationships: Comparing PLS-SEM and multiple regression.* Journal of Family Business Strategy, 2021.

51. Alias, R., M.H. Ismail, and N. Sahiddan, *A Measurement Model for Leadership Skills Using Confirmatory Factor Analysis (CFA).* Procedia - Social and Behavioral Sciences, 2015. **172**: p. 717-724.
52. Andion, O., et al., *Confirmatory Factor Analysis of Borderline Personality Disorder symptoms based on two different interviews: the Structured Clinical Interview for DSM-IV Axis II Disorder and the Revised Diagnostic Interview for Borderlines.* Psychiatry Res, 2011. **190**(2-3): p. 304-8.
53. Barney, J.L., et al., *Confirmatory factor analysis and measurement invariance of the Cognitive Fusion Questionnaire-Body Image in a clinical eating disorder sample.* Body Image, 2021. **38**: p. 262-269.
54. de Oliveira Bussiman, F., et al., *Confirmatory factor analysis and structural equation models to dissect the relationship between gait and morphology in Campolina horses.* Livestock Science, 2022. **255**.