Decision support system for consumer behavior of Elderly Chinese tourists on healthy beverages

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Abstract Based on tourist expenditure, food and beverages are a crucial market and healthy beverages are a dominant product developed to serve customer needs. At present, elderly tourist groups emerge with purchasing power in the tourism industry and related businesses. However, market and academic research on healthy beverages still need further knowledge and only a few decision support models exist. The objectives of this research are (1) to investigate major influential factors of consumer behavior (CB) of elderly Chinese tourists on healthy beverages; and (2) to structure a decision support system for CB. The research methodology employs qualitative and quantitative approaches. In-depth interviews are conducted by including 120 experts with 410 survey samples collected from Chinese tourists. Content analysis and structural equation modelling (SEM) are employed to analyze the data, including the sensitivity analysis for testing model robustness. The results show that marketing stimuli affect CB and product innovation at a significant level of 0.05. On the other hand, product innovation slightly affects CB at a significant level. The sensitivity analysis reveals that decreasing price and trial usage are influential CB. Also, the increasing and decreasing of attitude, relative advantage, and compatibility affect CB. This research aims to design an applicable decision support system of CB for Chinese tourists, which can identify influential factors of CB on healthy beverages when an entrepreneur launches a new product and be a guideline for SMEs to assess customer satisfaction by responding directly to customer needs. Moreover, the DSS model can also enable sustainable development and engage the right business strategies that resonate with customer needs.

Keywords: Healthy Beverages, Decision Support System, Structural Equation Modeling (SEM), Consumer Behavior, Hospitality Industry

1 Introduction

The COVID-19 crisis has affected every industrial sector in the world, especially the hospitality industry. The hospitality industry refers to a subsection within the service industry which comprises hotel businesses, restaurants, and tourism, all of which are a cornerstone of the Thai economy as they bring employment opportunities and lead to robust academic growth [1]. During the COVID-19 situation, the management of stocks of foods and beverages are difficult, due to unexpected stop/slow-down of customer's activities leading to food waste problem. Therefore, it is necessary to optimize the management of these supplies to the customer's demands. The sectors that generate the majority of revenue for the service industry are tourism and food & beverages (F&B). In order to optimize the F&B industry, entrepreneurs need to adapt themselves to overcome the shift in consumer behavior, e.g., new lifestyles, global trends, product innovation, health concerns, etc.

The food and beverage sector are at the lead based on tourists' expenditure in a destination country and obtains a large market share [2] whereby healthy beverages are one of the dominant products developed to serve customer needs. Healthy beverages are a kind of drink that contains vitamins, low sugar, and low caffeine; for example, vegetable juice, juice, herbal drinks, herbal tea, green tea, low-fat milk, and yogurt, among others. Generally, being healthy is the most desirable state for everybody and is a reason for people to be concerned about their longevity and quality of life, especially for aging populations. Therefore, to maintain good health, people consume healthy food and beverage. The healthy beverage market has its target groups classified by age, demographic, and gender. Preferences are upon customer perception towards taste, smell, and colors, such as orange juice, grape juice, apple juice, pomegranate juice, lime juice, coconut juice, green tea, etc.

Thailand is home to a large number of healthy beverage manufacturers, both market leaders and SMEs; for instance, Doi Kham, Gingen, Handyherb, QminC, Tipco, and Malee, which have a high production capacity, resulting in a low average cost per unit and competitive advantage compared to SME manufacturers.

As the number of aging populations is getting higher globally, this contributes to changes in various businesses, which is tourism where the group that owns high purchasing power is the elderly [3]. Chinese tourists

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are a dominant group that travels to countless destination countries throughout the globe, including Thailand. In 2018, Thailand welcomed approximately 10.5 million Chinese visitors while, in 2019, the number achieved a sharp growth of 27.5%, before the outbreak of the COVID-19 pandemic [4]. In this regard, the increment contributed to the highest tourism revenue (roughly USD 19,357 million). Currently, the Chinese populations are approximately 240 million and based on a survey conducted by the National Working Commission on Aging, the elderly Chinese tourists accounted for 20%. Elderly Chinese tourists increasingly travel at a steady rate compared to other age groups and are indeed a group that has a very high expenditure on tourism. Moreover, this group prefer travelling with a travel agency, either in-bound or out-bound. As Thailand is a popular destination for elderly Chinese tourists, it is an opportunity for Thai entrepreneurs to study the behavior of this tourist group.

Furthermore, changes in tourist behavior are quite complicated and need to be aware of by entrepreneurs. Literature review reveals that most tourists alter their interests to local food and beverage. Hence, it is a good sign for small and medium enterprises (SMEs) to enlarge their sales volume. Nonetheless, healthy beverage manufacturers still lack basic knowledge and research backup to develop their products that can fulfil customers' preferences. They need know-how to understand customer needs, create innovation to enhance the market share, and increase their competitiveness. To achieve the targets and prepare effective marketing strategies, a Decision Support System (DSS) is requested to empower SMEs to compete in the red ocean market. The DSS is an effective tool to help them decide on product development while also minimizing the costs [1]. Consequently, a study of DSS for CB of elderly Chinese tourists on healthy beverages is a guideline for SMEs to be informed of customer satisfaction and able to touch customer needs. Considering industrial engineering, the DSS is an efficient tool that facilitates the decision-making process of operators. In addition, technological approaches and scientific ones were applied to this research in order to shape a DSS applicable to the field of social sciences. Therefore, the development of the DSS model for improvement of marketing strategies and product development can enable the operators to optimize their businesses and attain competitive advantage, which eventually leads to sustainable development.

The elderly tourist groups emerge with potential purchasing power in the tourism industry and related businesses. Thus, it is still in need of both market and academic research as DSS models for commercial purposes with respect to beverages are still rare. Moreover, there are still gaps in the empirical data obtained from academic research that need to be fulfilled. As a result, the research objectives are (1) to explore major influential factors for consumer behavior of elderly Chinese tourists on healthy beverages; and (2) to structure a decision support system of consumer behavior toward healthy beverages.

2 Materials and Methods

This research studies factors that affect consumer behavior to create a DSS that helps an entrepreneur to finalize a decision on product development and improve marketing strategies. The research method involves literature review, research design, collection of qualitative and quantitative data, and analysis of the findings through Structural Equation Modeling (SEM). Afterwards, the model robustness is tested in a sensitivity analysis.

2.1 Consumer behavior (CB)

Kotler and Armstrong [5] summarized about four key types of factors influencing consumer behavior, which comprised marketing stimuli, other stimuli, consumer psychology, and consumer characteristics. In general, a consumer would decide to purchase a product based on his/her brand consciousness and the trust he/she has in such a product [6]. Brand and quality expectation is what consumers always look for. The previous study [6] expressed that brand conceptualization affected CB and [7] confirmed that customers trust a brand if they are confident in product quality. Consequently, brand, trust, and product expectations are considered CB in this study.

2.2 Marketing stimuli and product innovation

There are four components of marketing stimuli [5]: price, product, promotion, and place, which affect consumer behavior. On the other hand, other stimuli considered in the CB model are economy, politics, technology, and culture. [8] expressed that marketing mix (price, product, promotion, and place) is an influential factor in brand consciousness and consumer satisfaction. Similarly, [9] confirmed that the marketing mix affected the quality expectation of a product and trust in the brand that leads to purchasing decisions. [10] and [11] found that attitude and reference group affected consumer purchasing intention. The model from [12] indicated that attitudes, reference groups, and culture are major factors for CB. Then, in this research, marketing stimuli also cover other stimuli.

Drucker [13] explained that innovation is an important tool for entrepreneurs to build their potential in business competition using existing resources or further developing based on new knowledge. Thus, a crucial success factor for marketing strategies is innovation, as it brings more customers and markets via the improvement of sustainable competitive advantage [14]. Innovations consist of three main attributes: 1) novelty, 2) economic benefits, and 3) knowledge and creativity. However, academic research classified innovation into three areas, which are 1) innovation target (product innovation and process innovation), 2) innovation change (radical innovation and incremental innovation), and 3) innovation impact (technological innovation and administrative innovation). Nowadays, the demand shift for product innovation is noticeably higher which impacts the marketing stimuli. [5] given that innovative products in the commercial arena required manipulation through

customer adoption, which comprised five stages, i.e., awareness, interest, evaluation, trial, and adoption. The factors that influenced the adoption rate are 1) relative advantage – innovations that enjoy comparable products or substitutes; 2) compatibility – matching of customer values and experiences whereby a customer posits to purchase a specific innovative product; 3) complexity or degree of difficulty or easiness in using a specific innovative product; 4) divisibility or easiness with respect to the trial of a specific innovation; 5) communicability or how a specific innovation can be understandable or describable to others; 6) cost; 7) business risks generated by the innovation against the outcomes; 8) scientific credibility; 9) social approval. The study of [15] revealed that product innovation influenced purchasing decisions, similar to [16], which expressed that service innovation and product innovation affected marketing performance. Hence, companies that can combine both product innovation and service innovation can achieve greater revenue growth and more profitability.

In summary, marketing stimuli consist of price, product, promotion, place, attitude, reference group, and consumer culture while product innovation is composed of relative advantage, compatibility, trial usage, and communication.

2.3 Structural equation modeling

Structural Equation Modeling (SEM) is considered a robust multivariate approach that one employs to evaluate empirical data and causal assumptions of qualitative data. The SEM is applicable to several fields such as the study of tourism and tourist behavior [17], the study of the interrelationship between attitude, experiences, and overall customer satisfaction of elderly Australian tourists [18], the study of factors concerning attitudes of consumers that influence price shift and adoption [19], among others.

2.4 Decision support system (DSS)

A decision Support System can help an entrepreneur to engage in a decision-making process. A model is prepared to ensure businesses can respond to customer preferences. A DSS serves the management, operations, and planning levels to handle well-performed decision-making. Moreover, it is a useful appliance to increase consumer satisfaction and consumer confidence [20]. The DSS is applied in market research to study consumer purchasing behavior [21].

2.5 Research methodology

The research methodology is designed into three phases presented in Figure 1. Phase I: Literature Review, research and theories of CB concepts, marketing, product innovation, DSS, and healthy beverages are studied to identify appropriate factors. Phase II: Scenario Development consists of four steps. It starts with Phase II starts with engaging with the in-depth interview in step 1, collecting qualitative data, analyzing data using content analysis, and constructing a questionnaire in step 2. Next, the validity and reliability of the questionnaire are confirmed by experts in both academic and industrial fields and tested by Cronbach alpha coefficient (α) from 60 samples of the try out group in which the coefficient of the whole questionnaire is 0.946. Step 3, collecting quantitative data from 410 samples of Chinese tourists who visited Thailand between January – May 2022 in several tourist attractions around the country. Normally, SEM analysis requires only 280 samplings (14 latent variables × 20 multiply). Fourteen variables are price, product, promotion, place, attitude, reference group, consumer culture, relative advantage, compatibility, trial usage, communication, brand, trust, and product expectation. The data is analyzed by using SEM to create

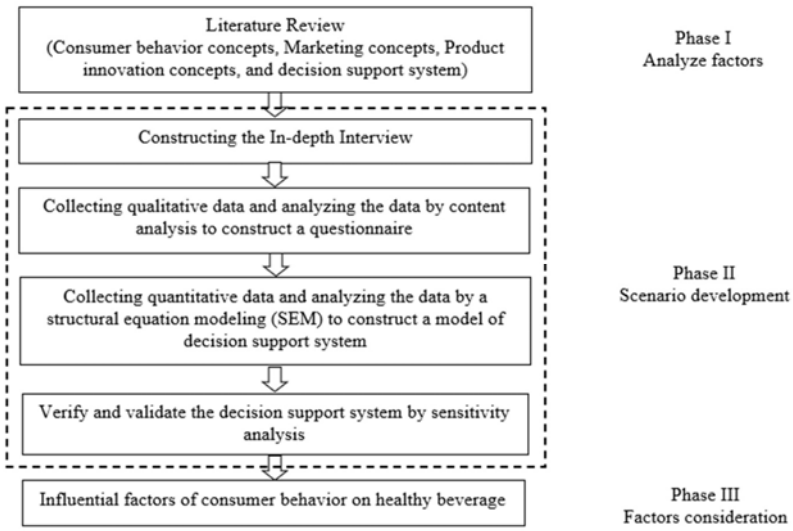

Figure 1. Research methodology for consumer behavior on healthy beverage

a DSS. The model is verified by using sensitivity analysis tests in the last step. Finally, the influential factors of CB on healthy beverages are expressed in Phase III: Factor consideration.

In this research, an in-depth interview is applied to collect qualitative data from 120 experts in the marketing field, DSS field, F&B industry, and entrepreneurs in F&B. The questions focused on an overview of the F&B industry, tourism industry, problems and obstacles, factors influencing CB, type of healthy beverages for elderly tourists, packaging, and marketing strategies. The questionnaire is divided into three sections as follows. Section 1 acquires general information about each respondent (e.g., gender, age, and health condition). Section 2 obtains feedback whether which factors possibly influence CB on healthy beverages. Then, a short comment for suggestion in section 3. The Cronbach's alpha coefficient of the whole questionnaire for 410 samples is 0.921.

3 Results and Discussion

3.1 Qualitative analysis from In-depth interview

The In-depth interview of 120 samplings is composed of both academic and industrial experts and entrepreneurs in the F&B sector, especially SMEs entrepreneurs from 6 parts of Thailand. There are North, South, East, West, Central, and Bangkok. In Appendix Table A.

3.2 Collecting quantitative data via marketing surveys

The respondents are female (56.60%) and aged between 60-65 years old (52.70%). Most of them are married (80.00%). They do exercise daily (70.00%), have a portion of healthy food at least 1 meal a day (45.20%), and have good health (70.00%). Construct's composite reliabilities (CR), Cronbach's alpha and average variance extracted (AVE) are employed to evaluate reliability, internal consistency, construct validity and the reflective measurement model. The result shows in Table 1 that the highest Cronbach's alpha coefficient is CB (0.93). Marketing stimuli (MS) and Product Innovation (PI) are 0.91 and 0.89, respectively. The AVE coefficients are ranging from 0.71 to 0.78 with which the highest coefficient is MS (0.78). CB and PI are 0.74 and 0.71 respectively. The highest CR coefficient is MS (0.79). CB and PI are 0.76 and 0.73, respectively. Ranging of the CR coefficients is from 0.73 to 0.79. Furthermore, the correlation coefficient between CB and MS is the highest (0.81), CB and PI are 0.72, and MS and PI are 0.78. Summarily, these data are shown that all figures have passed the acceptance criteria as shown in Table 2.

3.3 Data analysis by structural equation modeling (SEM)

Three hypotheses are verified which are H1, H2, and H3. H1 is a marketing stimulus that has a positive effect on CB, H2 is product innovation that has a positive effect on CB, and H3 is a marketing stimulus that has a positive effect on product innovation.

Structural Equation Modeling (SEM) is applied to examine these three hypotheses. The overall fit model is inspected by diagnostic indices which are shown in Table 3 [23]. If the construct validity is congruent with empirical data meant a good fit model.

Table 1: Means, SD, Cronbach's alpha, AVE, CR, and Correlation

Var.	*x*	S.D.	AVE	CR	CB	MS	PI
CB	3.53	0.72	0.74	0.76	(.93)		
MS	3.78	0.58	0.78	0.79	.81**	(.91)	
PI	3.35	0.67	0.71	0.73	.72**	.78**	(.89)

Cronbach's alpha is presented in parenthesis.
**Correlation is significant at the .01 level (2-tailed)
CB = consumer behavior, MS = Marketing stimuli, PI = Product innovation

Table 2: Standard statistic criterion

Statistics	Criterion	Reference
AVE	> 0.50	[23]
CR	> 0.70	[23]
Cronbach's alpha	> 0.70	[24]
Correlation coefficient	< 0.85	[24]

Table 3: Statistics criterion for model fit

Statistics	Criterion	Results
Relative Chi-Square ($\chi 2$/df)	< 2.00	1.055
Comparative Fit Index (CFI)	> 0.90	0.998
Goodness of Fit Index (GFI)	> 0.90	0.978
Adjusted Goodness of Fit Index (AGFI)	> 0.90	0.955
Root Mean Square Residual (RMR)	< 0.05	0.007
Root Mean Square Error of Approximation (RMSEA)	< 0.05	0.012

Figure 2 expresses the SEM fit model for CB on healthy beverages for elderly Chinese tourists. The model is composed of MS and PI. MS has a direct effect on CB with a strong relationship at the significant level of .05. While MS affects CB indirectly through PI with a slight relationship at a significant level of .05.

The result shows that H1, H2, and H3 are accepted at a significant level of .05. In H1, MS has a positive effect on CB with a coefficient of 0.66. This implied that price, product, promotion, place, attitude, reference group, and consumer culture affect consumer behavior on brand, trust, and product expectation. [5] explains the price, quality of product, promotion package, and distribution channel and product expectation. Accordingly, the reference group and consumer culture directly affect brand and purchasing decisions [19]. A study [25] found that advertisements, reference groups, and products influenced healthy food and beverage purchasing decisions at a significant level of .05, especially brand consciousness. (place) are directly influential factors for the brand and trust.

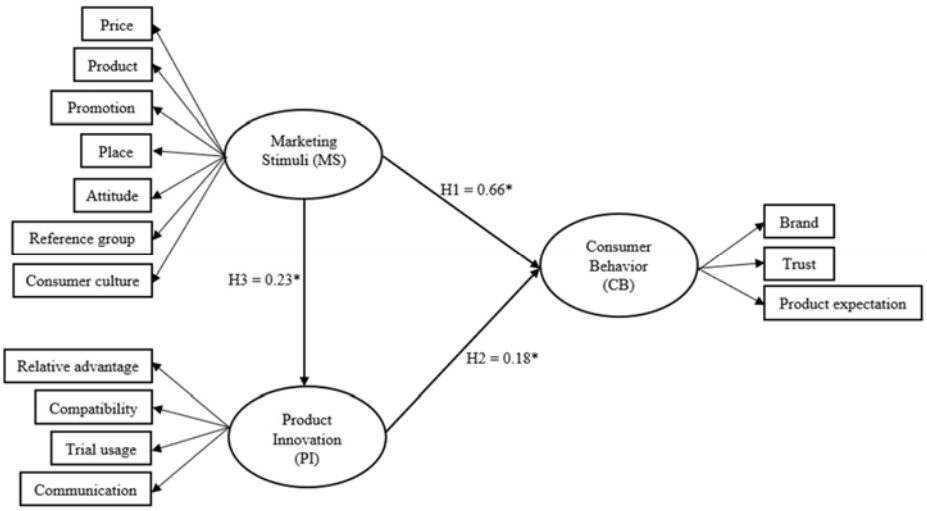

Figure 2. The SEM model for CB on healthy beverages for elderly Chinese tourist

In H2, PI has a slightly positive effect on CB with a coefficient of 0.18. This inferred that relative advantage, compatibility, trial usage, and communication have little effect on consumer behavior. [5] explains that consumers always compare product advantages to brands and their expectations. [25] confirmed that relative advantage and information influenced healthy food and beverage purchasing decisions at a significant level of .05, especially when considering the brand and product expectations. Then, product innovation has to be compatible with lifestyle and needs. Moreover, product innovation is necessary to compare with substitutes or former products.

In H3, MS has a slightly positive effect on the PI with a coefficient of 0.23. This means that MS has a little positive relationship with PI. The price, product, place, promotion, attitude, reference group, and consumer culture are slightly influential factors for product innovation. [5] explains that consumers have to be informed about the product advantage and product quality before making a purchasing decision. Reference groups and consumer culture are affected by communication together with trial usage which can increase sales volume. [19] explained MS is a key factor in the DSS of CB. Most consumers make a purchasing decision for a healthy beverage with a reasonable price, product benefit, and a promotion program. Normally, a consumer chooses types of healthy beverages based upon reference group, product trial, and attitude. Consumers purchase the beverages depending on brand reliability, quality expectation, and health benefit.

3.4 Creating a decision support system

The DSS model for CB of elderly Chinese tourists on healthy beverages is divided into 3 parts: Input, Output, and Description of the computer program. The input part provides blocks to fill in a username and a user number. During step 1, the number of their opinion for each independent variable is selected. Details of the numbers are as shown in Table 4. Once the save button is clicked, the output and description of the data appear.

In step 2, the output shows the statistical values of variables such as price to brand, trust, and product expectation of which the beta is 0.310, 0.192, and 0.290, respectively; and the t-value is 5.246, 2.963, and 3.535 respectively.

Table 4: Interpretation of number

No.	Definition
1	Least influence on consumer behavior
2	Less influence on consumer behavior
3	Average influence on consumer behavior
4	More influence on consumer behavior
5	Most influence on consumer behavior

In step 3, the description appears to explain the effect of the independent variable on the dependent variable. According to the above sample, price is the most influential of which the coefficient is 0.310. In contrast, it has the least influence on trust with a coefficient of 0.192.

3.5 Verifying by sensitivity analysis

Uncertainty of the model is studied using sensitivity analysis by apportioning to distinct data sets of uncertainty in the input blocks [24]. The sensitivity analysis forecasts the effects of outputs. A robust model is a focus when comparing the output. The model is robust if the output has no significant change. Conversely, the model is not robust if the output has a significant change.

The sensitivity model is done by estimating new independent variable data sets, which are increased by 20% and, on the other hand, are decreased by 20% from the mean value. Afterwards, the new data sets are input

into the SEM and observed for the robustness of the model.

There are eleven independent variables tested in the sensitivity analysis. The result shows price (X1+20%), product (X2+20%, X2–20%), promotion (X3+20%, X3-20%), place (X4+20%, X4–20%), reference group (X6+20%, X6–20%), consumer culture (X7+20%, X7-20%), trial usage (X10+20%), and communication (X11+20%, X11-20%) are robust. Price (X1–20%), attitude (X5+20%, X5-20%), relative advantage (X8+20%, X8-20%), compatibility (X9+20%, X9-20%), and trial usage (X10–20%) are non-robust. The result is shown in Table 5.

Table 5: The result of sensitivity analysis

Variables	Mean Value	
	+20%	–20%
Price (X1)	√	X
Product (X2)	√	√
Promotion (X3)	√	√
Place (X4)	√	√
Attitude (X5)	X	X
Reference group (X6)	√	√
Consumer culture (X7)	√	√
Relative advantage (X8)	X	X
Similarity (X9)	X	X
Trial usage (X10)	√	X
Communication (X11)	√	√

√ = Model is robust
X = Model is non robust

The result expresses that marketing stimuli, price (X1–20%) and attitude (X5+20%, X5-20%), are not robust because they change when the mean values are adjusted at both plus 20% and minus 20%. Accordingly, product innovation: relative advantage (X8+20%, X8-20%), compatibility (X9+20%, X9-20%), and trial usage (X10-20%) are not robust as well. This means that CB changed when the price of products decreased. Similarly, attitudes changed for both increase and decrease due to its subjective norm and market trend. While, the CB is changed when relative advantage and compatibility increase and decrease altogether with decreasing trial usage. Normally, the consumer always compares existing products or substitutes. The compatibility variable concerns lifestyle and needs. When an entrepreneur launches a new product to market, it is necessary to prepare a trial sample for a consumer. If not, then, the consumer would not trust the new product. The consumer who intends to purchase a healthy beverage chooses the beverage based on preferences, product quality, promotion, reference group, consumer culture, and communication. Therefore, an entrepreneur needs to disseminate more information about product advantages to the public and raise consumer perception of healthy beverages. Finally, attitude, relative advantage, and compatibility are of key importance to CB outcomes. The study of [10] and [11] informed that marketing stimuli influence the decision-making of consumers. Moreover, the entrepreneur also has to conduct product innovation, remarkably for relative advantage and compatibility when producing the beverage.

4 Conclusions

The COVID-19 pandemic affected the world economy and every industrial sector, especially the hospitality industry. The tourism and Food & Beverage sectors generate the majority of revenue for this industry. Therefore, entrepreneurs in this sector have to improve their capabilities to gain a competitive advantage. In the post-COVID era, consumer behavior has changed to a new normal, new lifestyle, and new trend. Thus, the study of consumer behavior in the F&B market is unavoidable. SMEs still lack know-how for product development and there is no efficient tool to support them in decision-making. The research objectives are (1) to examine major influential factors for consumer behavior of elderly Chinese tourists on healthy beverages; and (2) to structure a decision support system of consumer behavior toward healthy beverages. The result is a DSS of CB that is applicable to elderly Chinese tourists. The obtained tool helps entrepreneurs become aware of the influential factors of CB on healthy beverages whenever they need to launch a new product to the market.

The research result expressed that marketing stimuli: price, product, promotion, place, attitude, reference group, and consumer culture affect CB, directly and indirectly, affect CB through product innovation. Then, product innovation: relative advantage, compatibility, trail usage, and communication have a slightly direct effect on CB. The CB is composed of the brand, trust, and product expectations. The model is appropriate at a significant level of .05. When sensitivity analysis is applied, the result proves that most variables of the model are robust. An increasing or decreasing attitude, relative advantage, and compatibility, and decreasing price and trial usage of healthy beverages can influence CB, which means changing, increasing and decreasing attitude (norms or trend), information of product advantage, right products for lifestyles or preferences, and decreasing price of product potentially alter CB.

The DSS is an effective tool to assist Chinese tourists' satisfaction, which means that entrepreneurs gain a competitive advantage while increasing profit, promoting sales volume growth rate, and expanding product innovation to meet customer requirements. Afterwards, sensitivity analysis shows that price, attitude, relative advantage, compatibility, and trial usage are influential factors for CB of elderly Chinese tourists on a healthy beverage. When launching a new product, the entrepreneur has to ensure that the consumer's attitude is classified. The relative advantage is a fully informed consumer and a product that resonates with their lifestyle and needs. When launching a product to the market, trial samples have to be provided to the consumers.

On account of the highly competitive market for a healthy beverage, the DSS of healthy beverages for elderly Chinese tourists is an advantageous tool for entrepreneurs especially SMEs business because of its easy accessibility, user-friendliness, and applicability. Thus, it is sustainable development for the business if a DSS model can be successfully developed as it can save time and costs for

entrepreneurs in developing marketing strategies and products in response to customer needs.

This research is still limited as the sampling size is too small because what is focused on here are only the healthy beverages produced by SMEs. It is suggested to conduct further study on other groups of consumers, e.g., teenagers or health-conscious persons. Furthermore, the DSS is also applicable to other industries to study influential factors such as energy drinks, healthy food, etc.

Appendix

Table A: Results of In-Depth Interview

Topic	Results
1. Overview of the F&B industry	1) Due to the COVID-19 pandemic, the F&B industry has been impacted by the decreasing global demands, strong competition from newcomers in the market, and strengthening of the Thai baht currency. The F&B sector is sensitive to global trends and changes in consumers preferences. Nowadays, health consciousness becomes more concerned because of the crisis. Consumers are oriented to healthy food and beverages, which brings a good opportunity to the entrepreneurs in this sector. 2) Most experts said that the F&B industry had greatly grown compared to the last two years prior to the COVID-19 crisis. 3) A large number of product innovations with respect to healthy beverages were launched to the market upon consumer requirements. 4) The most important factors of the sector's growth are dynamic urbanization, advanced use of technology, growing e-marketplaces, export orientation, and increased interest in healthy food. 5) Thai F&B products drew attention from foreign countries and became a target market while also enjoying an advantage. 6) Critical points of the Thai F&B industry include dependence on tourism and export markets, food security issues, and organic farming
2. Overview of the tourism industry	1) The tourism industry brings widespread opportunities for employment and business expansions. 2) The tourism industry is a majority sector that contributes to a large amount of Thailand's GDP. 3) Thailand is known as one of the most visited destinations in the world. 4) In the post-COVID era, global tourism trends are more oriented to health and hygiene. Tourists' preferences shift from mass to niche segments; for example, medical and wellness, community-based tourism, and responsible tourism. 5) The technology adoption has forced out the tourism supply chain to enable contactless payment. 6) Tourism demands in the new normal era consist of niche travel, safety-first travel, and digitalization trends.
3. Problems and obstacles	1) Logistics system needs to develop effectively to bring products to foreign markets. 2) Labeling is required by the Food and Drug Administration (FDA), the process of which is time consuming and requires a lot of supporting documents. 3) Consumer trends are changing, and entrepreneurs need to be aware of the movements and innovations of their competitors. 4) Infrastructure has to be improved, both transportation and utilities.
4. Factors influencing consumer behavior	Most experts said that there were several factors e.g., psychological (including motivation, perception, learning, beliefs, and attitudes), personal (including age and life-cycle stage, occupation, economic circumstances, lifestyle, and personality), social (including reference groups, family, roles and status), and cultural factors.
5. Types of healthy beverages for elderly tourists	1) Types of healthy beverages are divided based on consumer needs. There are (1) beverages for therapeutic nutrition with higher calories; (2) beverages that are refreshing and alternative to creamy shakes; (3) beverages to aid recovery from illness, injury, or surgery (4) beverages to minimize blood sugar spikes; (5) beverages for medication programs; and (6) plant-based or vegan beverages. 2) Normally, the elderly are advised to drink still water and to minimize drinking sweetened, carbonated drinks, and/or drinks containing caffeine. 3) Most experts said that healthy beverages consisted of fruit juices, vegetable juices, low-calorie/low-fat/non-fat milk, green tea, mix-berries juice, etc.
8. Packaging	1) Packaging is compact, lightweight, not slippery, and can be comfortably carried on. 2) Label is clearly understandable. 3) Packaging is impressive.
9. Marketing strategies on healthy beverages for elderly Chinese tourists	1) Contact a travel agency. 2) Present choices of healthy beverages at tourist attractions. 3) Present interesting promotions and launch an interesting advertisement. 4) Prepare some samples for testing. 5) Communicate in the Chinese language. 6) Acquire reference groups.

Acknowledgements

This research has received funding support from The National Science, Research and Innovation Fund (NSRF) (Grant No. KMUTNB-FF-65-05).

References

[1] A. Kengpol, T. Pichitkarnkar, K. Elfvengren. A decision support system for consumer behavior of Chinese in-bound tourists on functional beverage: An Empirical Study during COVID-19 with Thailand Sandbox, Applied Science and Engineering Progress, 15, 1 (2022): 5420

[2] J. Ofori, Y. Peggy. Novel technologies for the production of functional foods in Bio-nanotechnology: A Revolution in Food, *Biomedical and Health Sciences*. Chichester, UK: John Wiley & Sons (2013)

[3] W. Yonwikai, Business Development Guidelines to Support Tourism Behaviours of Elders Travelling in Thailand, Dusit Thani College Journal, 13, 2 (2019)

[4] Thai Websites. Tourism Statistics Thailand 2000–2021, [Online]. Available: https:// www.thaiwebsites.com/tourism.asp (2021)

[5] P. Kotler, G. Armstrong, *Principles of Marketing*. 16th ed., Essex, UK: Pearson Education Limited, (2016)

[6] B. Chua, H. Kim, S. Lee, H. Han, The role of brand personality, self-congruity, and sensory experience in elucidation sky lounge users' behaviour, Journal of Travel & Tourism Marketing, 36, 3 (2018): 1–14

[7] N. Rubio, J. Oubiña, N. Villaseñor, Brand awareness–Brand quality inference and consumer's risk perception in store brands of food products, Food Quality and Preference, 32 (2014): 289–298

[8] W. Efanny, J. Haryanto, M. Kashif, H. Widyanto, The relationship between marketing mix and retailer-perceived brand equity, IMP Journal, 12, 1 (2018): 192–208

[9] A. Nayeem, S. Raja, R. Shojib, The impact of marketing mix in fascinating customers perception: Case study on online banks in Bangladesh, IEEE-SEM, 8, 1 (2020): 231–241

[10] A. Feil. C. Cyrne, F. Sindelar, J. Barden, M. Dalmoro, Profiles of sustainable food consumption: Consumer behavior toward organic food in southern region of Brazil, Journal of Cleaner Production, 258 (2020): 120690

[11] J. Singh, L. Quamina, T. Xue, Ten million followers and counting: How digital brand alliances between online influencers and brands impact consumer value: An abstract perceptions, in *Proceedings of the Academy of Marketing Science Conference of 2017 (AMSAC 2017)*, (2017): 24– 26

[12] L. Schiffman, L. Kanuk, *Tourist behaviour*. 10th ed. Prentice Hall, (2009)

[13] P. Drucker, *Management challenges for the 21st century*. Harper Collins., (1999)

[14] N. Kanagal, Innovation and product innovation in marketing strategy, Journal of Management and Marketing Research, 18 (2015)

[15] Q. Luo, M. Suacamram, Product Innovation and National Image of Chinese Products in the Eyes of Thai People, SAGE Open, (2022): 1-13

[16] A. Nataya, J. E. Sutanto, The Effect of Product Innovation and Service Innovation towards Marketing Performance (Case Study on Plastic Producer in Surabaya), International Journal of Business and Management Invention, 7, 8 (2018): 61-66

[17] T. Müller, F. Schuberth, J. Henseler, PLS path modeling – A confirmatory approach to study tourism technology and tourist behaviour, Journal of Hospitality and Tourism Technology, 9, 3 (2018): 249–266

[18] L. Sie, K. Phelan, S. Pegg, The interrelationships between self-determined motivations, memorable experiences and overall satisfaction: A case of older Australian educational tourists, Journal of Hospitality and Tourism Technology, 9, 3 (2018): 354–379

[19] W. Wang, The influence of perceived technological congruence of smartphone application and air travel experience on consumers' attitudes toward price change and adoption, Journal of Hospitality and Tourism Technology, 10, 2 (2019): 122–135

[20] R. Pereira, Factors influencing consumer perceptions of Web-based decision support systems, Logistics Information Management, 12, 1/2 (1999): 157–181

[21] A. Massari, F. Manca, F. Girone, Multiple correspondence analysis for customer segmentation in large retail groups, Electronic Journal of Applied Statistical Analysis, 9, 4 (2016): 637– 654

[22] J. F. Hair, *Multivariate Data Analysis,* 7th ed. New Jersey: Pearson Prentice-Hall, (2010)

[23] R.B. Kline, *Principles and Practice of Structural Equation Modeling,* 2nd ed. New York: Gilford Press, (2005)

[24] A. Saltelli, M. Ratto, T. Andres, F. Campolongo, J. Cariboni, D. Gatelli, M. Saisana, S. Tarantola, *Global Sensitivity Analysis: The Primer*. West Sussex, England: John Wiley & Sons Ltd., (2008)

[25] K. Ahalya, B. Sreeya, Effect of Brand Image On Beverages: A Research on Health Drinks In Chennai, International Journal of Innovative Technology and Exploring Engineering (IJITEE), 8,11 (2019): 3167-316