

Adulyanukosol, Adul; Silpcharu, Thanin

Article

Footwear design strategies for the thai footwear industry to be excellent in the world market

Journal of Open Innovation: Technology, Market, and Complexity

Provided in Cooperation with:

Society of Open Innovation: Technology, Market, and Complexity (SOItmC)

Suggested Citation: Adulyanukosol, Adul; Silpcharu, Thanin (2020) : Footwear design strategies for the thai footwear industry to be excellent in the world market, Journal of Open Innovation: Technology, Market, and Complexity, ISSN 2199-8531, MDPI, Basel, Vol. 6, Iss. 1, pp. 1-11, <https://doi.org/10.3390/joitmc6010005>

This Version is available at:

<https://hdl.handle.net/10419/241403>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



<https://creativecommons.org/licenses/by/4.0/>



Article

Footwear Design Strategies for the Thai Footwear Industry to Be Excellent in the World Market

Adul Adulyanukosol * and Thanin Silpcharu

Faculty of Business Administration, King Mongkut's University of Technology North Bangkok,
1518 Pracharat 1 Road, Wongsawang, Bangsue, Bangkok 10800, Thailand; tanin@fbakm.com

* Correspondence: s5714011950071@email.kmutnb.ac.th; Tel.: +66-818-087-350

Received: 5 December 2019; Accepted: 3 January 2020; Published: 10 January 2020



Abstract: The potential of Thai industrial product design is still inferior to that of the leading competitors in the world market, which gives more importance to design during the product development to increase Thailand's competitive edge on a commercial scale. Product design is a very important part of sustainable growth in this industry. Thus, this research aims at investigating footwear design strategies for the Thai footwear industry to be excellent in the world market. The research has been designed with a mixed method of both qualitative and quantitative study. The quantitative data were collected through a semi-structured interview of 500 designers who presented their designs to join an award competition. The results reveal that the footwear design strategies consisted of four factors: (1) design, (2) market analysis, (3) innovation, and (4) information technology. This paper utilizes the method of structural equation modeling (SEM) to establish a strategic model for competitive advantage in the Thai footwear industry. The analysis results indicate that the footwear design strategies model could help make more effective policies and organization strategies for enterprises and designers to develop themselves towards excellence in the world market.

Keywords: strategies; design; footwear industry; structural equation model; competitive edge

1. Introduction

Shoes are one of the four basic needs of clothing fashion, and the shoe market is expanding worldwide. The footwear industry is one of the most important fashion products of the economic system. The growth rate of the footwear industry forecasted by specialists was 3.9% in 2013 and became 4.1% in 2014 with continuous growth at 4.9%, 5.2%, 5.3%, and 5.5% yearly from 2015 to 2018. Regarding the geographical market share, the two biggest players were America and Europe with 38.2% and 38.1% of the market, respectively. They were followed by the Asia Pacific Region, with a market share of 19.7% [1]. While the growth rate of the world footwear industry, including Asia Pacific, has been increasing, the manufacturing and export rate of Thailand has declined. According to a survey by the Thailand Textile Institute in 2014, the value of the exported product was 713.40 million USD, a decline of 3.34% to the growth rate. Sport shoe exports declined 47.84%, sandals declined 4.98%, and shoe parts decreased by 51.64%. Even the biggest exporting market, the US, declined 5.08% in 2010 [2]. Moreover, the industrial index confirmed a decline in sandal production from 92.25% in 2013 to 77.77% in 2017. This is a critical situation for the Thai footwear industry [3].

As mentioned above, the footwear industry plays an important role in the Thai economy. It can be categorized into several types, such as rubber shoes, plastic shoes, sports shoes, sandals, genuine leather shoes, artificial leather shoes, and shoe parts, creating huge income for the country. According to analysis by The Office of ASEAN Industrial Economics, the decline of manufacturing and export results from weaknesses in the competition. The weaknesses include the lack of designers and technology in designing, especially highly skilled designers who are aware of the difference in consumer behavior [4].

This is in line with the report by World Design Rankings [5], whose survey of world industrial design ranking during 2010 and 2017 revealed that Thailand was ranked 47th with only 71 points. The highest-ranked country was the US, with a score of 2168. This critical situation is the main obstacle in running a business with high competition in a free trade market. The Thai footwear industry cannot survive unless appropriate marketing strategies to increase its competitive edge are set up. This can be achieved by employing product design coping with customer needs, together with increasing the research and development (R&D) budget for researching consumer behavior and fashion trends [6]. The production process technology should be developed whilst the innovation in the organization should be promoted [7,8]. Furthermore, there should be cooperation with stakeholders to increase the opportunity for creating innovation from alliances to increase the competitive edge [9]. It is necessary to elevate personal potential by promoting an organization that values learning. This will increase the number of designers and inventors [10]. The concept of sustainable development should be embedded in the organization to motivate creative ideas in every function, which will help in surviving alongside a significantly increasing critical competition [11]. Ultimately, this research tries to highlight footwear design strategies for the Thai footwear industry to be excellent in the world market.

2. Literature Review

Designing is an outstanding characteristic of all businesses, affecting every aspect including production, services, and marketing [12]. This is not only due to consumer needs but also for offering a greater value proposal to customers [13]. It can be important to consider at many points in the business process, starting from identifying the customer needs that the business can respond to, through R&D, and even up until getting IT information for the designing. Thereafter, the product is created through the process of manufacturing and services, passing through the selling process, and delivered with added value as required by the consumer. The cost of the designing process is only about 5% but can add an increased product value of up to 70%. This investment is minimal when compared with other costly steps of production [14]. That is to say that designing is a very important step in every business, especially a low investment industry such as footwear, as it is needed to add more value to the product. The key to design success includes creative ideas integrated with form, functions, ergonomics, manufacturability, and marketability [15]. These factors should be harmoniously aligned with the consumer's way of life, fashion, and response to general consumer needs. The product should possess its own identity, with magnificent attraction based on marketing and production feasibility. With the input of enhancement through advanced technology, the output can be called innovation [16].

Innovation is the development of an idea linked with the marketing factors driving social needs and attracting a marketing response idea. Science and technology play a big role in pushing the development of innovation. This process relies on an existing scientific foundation capability of the company (i.e., R&D), manufacturing, marketing, and commercial products. The innovation process is a complicated route requiring knowledge transfer both inside and outside the organization, connecting marketing factors with science and technology factors. If this can be accomplished effectively, the organization can pursue successful innovation [17].

An organization needs to create innovation regularly because it is the tool for a competitive edge, to create good profit for the business, and grow the company's market share. However, some administrators have the opinion that it is very difficult to generate sustainable innovation [18]. Therefore, continuously new product development can reduce marketing risk. Technology change and the shortening of product life cycles are obstacles to market competition. Any organization needs to focus on the effectiveness of the new product development process [19]. When the product is in a stage of decline, R&D is an essential factor to develop a new product, responding to the consumer needs, to bring the product life cycle back to its starting point.

Market analysis is the process of collecting data of the target consumer to set up a marketing strategy leading to business success. Marketing data are crucial in helping administrators make decisions. Accurate marketing information is valuable for any business. To gain information, it is

necessary to analyze the in-depth information of the consumer [20]. Setting up a marketing strategy is a very important factor for the industrial business to communicate at all levels in the organization to pursue the same operation direction, the same business target, and to specify the company's future direction. Hence, defining marketing strategy must be performed precisely and can be communicated to every level in the organization to create a sense of sharing. Moreover, it can connect with the future marketing plan, leading to the effective utilization of organizational resources [21].

Information technology is also used for information management in the organization to increase its production, reduce cost, and increase the efficiency of industrial operation. IT is also a part of the modern way of living, which reflects the consumer's attitudes. An entrepreneur must place importance on IT, computer system development, and communication systems for increasing productivity, reducing cost, and increasing work efficiency, which will result in an automation system. This will gain efficient total services and be the communication channel with customers, suppliers, and a form of social communication. In every management system, IT plays an important role in operation and decision; thus, the business system requires IT for its operation [22].

Designing marketing analysis and information technology mentioned is an important part that supports constructing the innovation that drives potential competition [12,17]. The organization is always required to be creative, since innovation is a tool for creating competitive advantage, increasing the profitability of the business, and creating market share growth [18]. The key factors of enterprise innovation are research and development to make a difference. This includes information technology factors for marketing communication between the organization and the market to obtain important information for constant research and developing new products [22]. This will avoid the risk of uncertain market demand. Technological change and the reduction of the product life cycle is the barrier to market competition [20]. Focusing on the efficiency of the new product development process is essential to the survival of the organization [19]. From the reasons mentioned above, the researcher has connected the concepts and theories to the study by four latent variables, which are design, marketing analysis, information technology, and innovation, which lead to the research hypotheses as follows, H1: IT factor has a direct influence on innovation factors. H2: IT factor has a direct influence on market analysis factors. H3: Innovation factor has a direct influence on design factors. H4: Market analysis factor has a direct influence on design factors. From the concepts and literature review above, the researcher proposes components of footwear design strategies for the Thai footwear industry to be excellent in the world market as shown in the research framework in Figure 1.

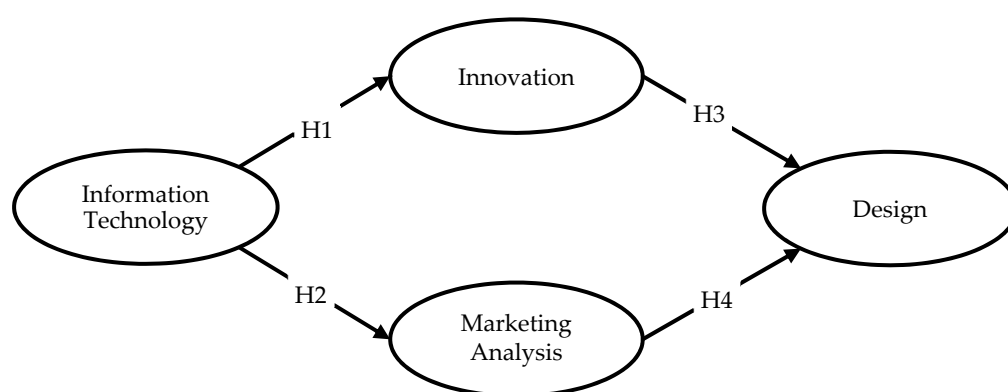


Figure 1. Framework of the study.

3. Materials and Methods

This study was designed as mixed methodology research of both qualitative and quantitative studies. The qualitative data were derived from an in-depth interview with 9 experts with the required qualifications. The data were then used to construct questionnaires presented to 500 [23] designers whose names were in the database of Thailand Creative and Design Center (TCDC) that presented their

designs to join the award competition. The data from the questionnaires were then used to design the structural equation model based on the framework. The structural equation model was then validated for the reliability in the focus group of 7 interdisciplinary experts with the same criteria of the former expert group. They joined the conference to validate and certify the model for the development of the implementation.

3.1. Qualitative Research 1

The researcher constructed structured in-depth interviews in an open-ended form based on the review literature. They were used to interview 9 experts focusing on footwear design strategies. After deriving the complete contents, the data then were analyzed and arranged into questions in the questionnaire of 5 Likert scales [24]. The questionnaire was then revised and validated to be the tool for quantitative research.

3.2. Quantitative Research

The questionnaire is divided into four parts: (1) general information of the designers, (2) general characteristics of the design in organization, (3) strategies in footwear designing (data from qualitative part, as it requires more accurate design strategies to guarantee its correctness of the information together with the literature review), and (4) opinions and suggestions. The questionnaire was validated for content validity by 5 experts and then tested for reliability with discriminant analysis through the SPSS program. After passing the criteria, the questionnaire was used to collect data from the sample group.

3.3. Qualitative Research 2

The researcher conducted the 2nd round of the qualitative research by analyzing the quantitative results in the focus group with seven experts who joined the conference to discuss and analyze several in-depth points based on the structural equation model. The data were analyzed through content analysis for the descriptive discussion to develop a more complete model. This qualitative research provides an opportunity for multidisciplinary experts to gather to freely express their opinions and critiques regarding the model the researchers have created, to develop the model to be suitable for actual use, and to maximize benefits to designers. The model can provide correctness and accuracy for various issues based on the outcome of the study upon the valuable experience of all the experts.

3.4. Assessment of Research Tools

The analysis of content validity was conducted through the index of item objective congruence (IOC) with the IOC values between 0.6 and 1.0 higher than the set criteria at 0.50 [25]. The reliability value of the questionnaire was gained from the pilot study of 30 subjects to find the discriminant analysis (DA) with the DA values of the checklist items between 0.45 and 1.88 higher than the set criteria at 0.30 [25]. The rating scale items were analyzed through Cronbach's alpha with the reliability value at 0.98 higher than the set criteria at 0.80 [26]. It can be concluded that the questionnaire reached very high reliability.

3.5. Data Analysis

The data were analyzed with both descriptive statistics and inferential statistics using the SPSS program. Multivariate statistical analysis and structural equation modeling (SEM) were conducted through AMOS with the evaluation of data model fit of four values [27], i.e., (1) chi-square probability level with p (CMIN/ P) > 0.05, (2) relative chi-square (CMIN/DF) < 2, (3) goodness-of-fit index (GFI) > 0.90, and (4) root mean square error of approximation (RMSEA) < 0.08.

4. Results

4.1. Results of Descriptive Data Analysis

The results of the qualitative study through in-depth interviews revealed that there were four components of design strategies. The information was then used to write 97 questions consisting of 24 items in designing, market analysis, innovation and 25 items in information technology. It was found that product designers and fashion designers gave importance to footwear design strategies at a high level with an average score of 3.99. When considering each aspect, it was found that the market analysis was ranked the highest with an average score of 4.02. When considering based on the different groups of designers, it was found that there was a statistically significant difference at 0.05. When considering the difference in each aspect, it was found that the design aspect showed a significant difference at 0.05. It is noticeable that product designers placed more importance on design strategies than did the fashion designers. There was no statistically significant difference on market analysis, innovation, and IT, as shown in Table 1.

Table 1. Descriptive and inferential statistics analysis.

Variables	\bar{X}	SD	t-Value	p-Value
Overall	3.99	0.49	2.07	0.04 *
Design	3.96	0.49	2.55	0.01 *
Market analysis	4.02	0.51	1.88	0.06
Innovation	3.97	0.55	1.52	0.13
Information technology	4.02	0.57	1.74	0.08

Note: * $p < 0.05$.

4.2. Result of Structural Equation Model

Inappropriate empirical data were deleted one by one, and then the new model was preprocessed until those four variables passed the set criteria [27]. After the model adjustment, it was found that $CMIN/P = 0.163$, $CMIN/DF$ value = 1.102, $GFI = 0.962$, and $RMSEA$ value = 0.014 passing the model evaluation criteria and in line with the empirical data, as shown in Table 2 and Figure 2.

Table 2. Goodness-of-fit indices for structural model.

Fit Indices	Accepted Value	Model Value
Chi-square (χ^2)		203.835
Degrees of freedom (DF)		185
Chi-square probability level with p ($CMIN/P$)	>0.05	0.163
Relative chi-square ($CMIN/DF$)	<2	1.102
Goodness-of-fit index (GFI)	>0.90	0.962
Root mean square error of approximation (RMSEA)	<0.08	0.014

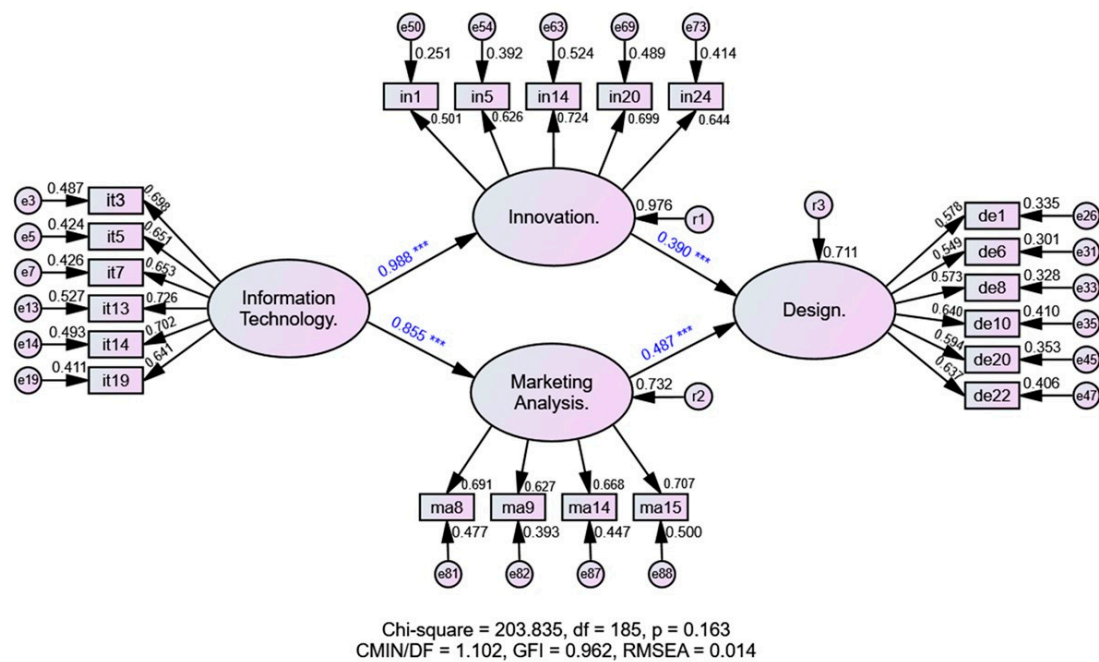


Figure 2. The final simplified and refined structural equation model with standardized path coefficients and factor loadings.

4.3. Measurement of Variables

Innovation

in1: Establish product prototype using modern technology, e.g., 3D printing technology.

in5: Register a patent of innovative products created by the organization.

in14: Give a motivation award to anyone in the organization for creating innovation.

in20: Arrange innovation week in the organization to exhibit the company's products as well as outstanding innovative products from outside to create pride of ownership and inspiration to all employees.

in24: Cooperate with suppliers to conduct R&D on the production of raw materials.

Design

de1: Designing should focus on eco-products as results.

de6: Design products that can create a story to tell consumers.

de8: Design products to suit certain attire.

de10: Create work by thinking outside of the box, e.g., different designs from the traditional ones.

de20: Designers and designing process can work and be conducted independently.

de22: Workplace is arranged to a create creative-thinking environment.

Marketing Analysis

ma8: Conduct internal marketing to communicate the same product information to all employees, so they can proudly transfer the information to outsiders.

ma9: Arrange customer feedback and customer surveys regularly.

ma14: Implement creating shared value (CSV) concept on marketing operation.

ma15: Establish a marketing team to support designers.

Information Technology

it3: Conduct a membership registration with organizations or associations relevant to designing both in Thailand and abroad.

it5: Information on designing function must possess a security system to protect from data leaking and must be kept confidentially.

it7: Designers must join training seminars related to the shoe and fashion activity at least twice annually to get new ideas for their product creation.

it13: Establish a budget for information development.

it14: Arrange a training course on knowledge and skill enhancement of information technology for designers.

it19: Create a working team that can operate anywhere and at any time through the utilization of digital organization technology.

4.4. Results of Hypothesis Testing

The empirical data on the IT aspect have direct influence on empirical data of the innovation aspect and market analysis with the statistical significance at 0.001 with factor loading of 0.988 and 0.855, respectively, in line with the hypothesis. The empirical data on innovation have direct influence on the design aspect with the statistical significance at 0.001 with factor loading of 0.390, in line with the hypothesis. The empirical variable on market analysis has direct influence on the design variable with the statistical significance at 0.001 with factor loading of 0.487, in line with the hypothesis (Table 3). The final refined structural equation model with standardized coefficients and factor loadings is shown in Figure 2. Table 4 presents the corresponding standard effort of estimates and *p*-values.

Table 3. Summary of hypotheses testing results.

Path		Estimate (β)	SE	CR	<i>p</i>	Result
Information Technology	→ Innovation	0.988	0.065	10.434	***	Support
Information Technology	→ Marketing Analysis	0.855	0.059	12.782	***	Support
Innovation	→ Design	0.390	0.121	3.433	***	Support
Marketing Analysis	→ Design	0.487	0.098	4.144	***	Support

Note: β = standardized beta coefficients; SE = standard error; CR = critical ratio; *** *p* < 0.001.

Table 4. The standardized regression weights and covariance estimates of the final refined structural equation model.

Path		Estimate (β)	SE	CR	<i>p</i>
Innovation	→ in1	0.501			
Innovation	→ in5	0.626	0.129	9.938	***
Innovation	→ in14	0.724	0.134	10.716	***
Innovation	→ in20	0.699	0.138	10.536	***
Innovation	→ in24	0.644	0.123	10.091	***
Design	→ de1	0.578			
Design	→ de6	0.549	0.106	9.678	***
Design	→ de8	0.573	0.111	9.985	***
Design	→ de10	0.640	0.113	10.785	***
Design	→ de20	0.594	0.103	10.247	***
Design	→ de22	0.637	0.106	10.747	***
Marketing Analysis	→ ma8	0.691			
Marketing Analysis	→ ma9	0.627	0.077	12.382	***
Marketing Analysis	→ ma14	0.668	0.076	13.111	***
Marketing Analysis	→ ma15	0.707	0.077	13.766	***
Information Technology	→ it3	0.698			
Information Technology	→ it5	0.651	0.064	13.617	***
Information Technology	→ it7	0.653	0.068	13.661	***
Information Technology	→ it13	0.726	0.066	15.114	***
Information Technology	→ it14	0.702	0.061	14.635	***
Information Technology	→ it19	0.641	0.065	13.422	***

Note: β = standardized beta coefficients; SE = standard error; CR = critical ratio; *** *p* < 0.001.

4.5. Results of Focus Group Discussion

The researcher conducted the focus group of seven interdisciplinary experts to confirm the structural equation model, resulting in all seven experts agreeing with the consensus that the structural equation model of footwear design strategies for the Thai footwear industry to be excellent in the world market was confirmed.

5. Discussion

The empirical variable of IT influences directly on innovation empirical variables at a statistically significant level of 0.001. This can be explained by IT contributing directly to more productivity, cost reduction, and higher operational efficiency in business concerning economy, trading, and industry [22,28], conforming with the study of Valmohammadi; Nieves and Osorio; Ruiz-Torres et al.; and Yun and Park [29–32], who found that IT influences directly on innovation. Therefore, IT is necessary for designers in the Thai footwear industry. Designers should use IT as a tool for new and up-to-date information to create innovative products that are different from their competitors and demanded by the market.

The IT empirical variable influences directly on marketing analysis empirical variables at a statistically significant level of 0.001. This is because for marketing analysis, it is necessary to use IT in searching for data and useful information. Moreover, type of information has a direct influence on consumer attitudes [22], in line with the study of Panda and Rath; Yun and Liu [33,34]; and that of Rahman and Mannan [35], who found that IT data influences directly on marketing analysis. In the present day, marketing data are valuable and powerful sources of information in reaching consumers. If the designer wants their work to be widely accepted by consumers, it is essential to use IT as a search tool to find the true needs of the market. Once receiving the desired information, it can be used to create the designs that influence consumers. Market information is constantly updated, so designers should always be updating IT.

The innovation empirical variable influences directly on the design variable at the statistically significant level of 0.001 because innovation and technology acceptance are considered as social behaviors, since there are levels of difference of individuals in technology acceptance [16,36–39]. This is in line with the study of Sarmah, Kamboj, and Kandampully and that of Valaei, Rezaei, and Emami [40,41], who found that innovation influences directly on designing. Innovation drives the design to achieve the acceptance of the creation. Therefore, designers must utilize innovation as a basis for their designs to create different types of work because they can be used for commercial purposes and can be manufactured at the industrial level. The design should always consider innovation so that the products acquired from the design can hold a market share for a long period until there is updated innovation replacement.

The empirical variable of marketing analysis has a direct influence on the design variable at a statistically significant level of 0.001 because during the designing, it is important to consider not only attractive appearance but also user practicality. The designing process requires the analysis of consumer needs, particularly from feedback, which can help the designers to create the simulation before the real product [42] in line with the study of Wu, Kang, Damminga, et al.; Workman, Lee, and Jung [43,44], and Coudounaris [45], stating that market analysis has direct influence on design. Designers should follow the market need to get consumer attention toward the product they designed and always conduct a marketing survey to know each market target, so that the design meets with market demand. This demand will become valuable when the designer is the first to discover and create a product that meets with the market needs.

6. Conclusions

Enterprises and designers must develop themselves to become learning organizations with technology sharing and creative innovation for designer teams. The exchange of knowledge and

information helps in filling the gap; thus, a completer and more innovative product can be designed. Other important factors should also be considered, such as production engineering information, marketing communication information easily accessed by the consumer, raw material resources, etc. Thorough market analysis and consumer-centric theory are other variables for successful design on a commercial scale. Designers and enterprises must place importance on IT because IT can help them access up-to-date information rapidly. They also need to know how to utilize social media to approach the target consumer directly. Moreover, the products must be environmentally friendly and must address social concerns. Finally, designers must be aware that they are only a part of the design strategy process. Hence, they should open to all aspects of information, including marketing, technology, innovation, way of life, culture, etc., for creating unique products defining their own story together with utility, beauty, need, and art appreciation responding to humankind.

Author Contributions: Conceptualization, A.A. and T.S.; methodology, A.A. and T.S.; software, A.A. and T.S.; validation, A.A. and T.S.; formal analysis, A.A.; investigation, A.A.; resources, A.A.; data curation, A.A.; writing—original draft preparation, A.A.; writing—review and editing, A.A.; visualization, A.A.; supervision, T.S. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Marketline. *Industrial Profile: Global Footwear May 2014*; Marketline: London, UK, 2014; pp. 8–10.
2. Thailand Textile Institute. *Thai Textile Statistics 2014/2015*; Thailand Textile Institute: Bangkok, Thailand, 2014; pp. 84–88.
3. Ministry of Industry. *Industrial Economic Status Report for 2018 and Outlook for 2019*; Office of Industrial Economics: Bangkok, Thailand, 2018; pp. 202–216.
4. Ministry of Commerce. *AEC: Frequently Asked Questions*; Department of Trade Negotiations: Nonthaburi, Thailand, 2013; pp. 1–3.
5. World Design Rankings. Current Aggregated World Design Rankings: Years 2010–2017. Available online: <http://www.worlddesignrankings.com> (accessed on 31 January 2019).
6. Hsu, Y. Design innovation and marketing strategy in successful product competition. *J. Bus. Ind. Mark.* **2011**, *26*, 223–236. [CrossRef]
7. Tristao, H.M.; Oprime, P.C.; Jugend, D.; da Silva, S.L. Innovation in industrial cluster: A survey of footwear companies in Brazil. *J. Technol. Manag. Innov.* **2013**, *8*, 45–56.
8. Hair, J., Jr.; Brush, R.P.; Ortinau, D.J. *Marketing Research*; McGraw Hill Companies Inc.: Singapore, 2000; pp. 8–10.
9. Cardoso, F.S.P.A.; Torkkeli, M. Innovation in footwear companies—Does it pay off? *J. Eng. Des. Technol.* **2014**, *12*, 128–154.
10. Bateman, T.S.; Snell, S.A.; Konopaske, R. *Management: Leading & Collaborating in a Competitive World*, 11th ed.; McGraw Hill Companies Inc.: New York, NY, USA, 2017; pp. 299–302.
11. Robbins, S.P.; Judge, T.A. *Organizational Behavior*, 15th ed.; Pearson Education Inc.: Cranbury, NJ, USA, 2013; pp. 224–225.
12. Bruce, M.; Bessant, J. *Design in Business: Strategic Innovation Through Design*; Pearson Education Limited: England, UK, 2002; pp. 18–20.
13. Heskett, J. *Design: A Very Short Introduction*; Oxford University Press Inc.: New York, NY, USA, 2005; pp. 1–3.
14. Boothroyd, G.; Dewhurst, P.; Knight, W.A. *Product Design for Manufacture and Assembly*, 3rd ed.; CRC Press: Boca Raton, FL, USA, 2011; pp. 5–8.
15. Heskett, J. *Design and the Creation of Value*; Bloomsbury: London, UK, 2017; pp. 56–57.
16. Design Council. *Design for Innovation*; Design Council: London, UK, 2011; pp. 1–4.
17. Trott, P. *Innovation Management and New Product Development*, 6th ed.; Pearson Education Limited: London, UK, 2017; pp. 24–25.

18. Wutthirong, P. *Innovation Management: Resource Learning Organization and Innovation*; Chulalongkorn University Press: Bangkok, Thailand, 2014; pp. 17–18.
19. Kotler, P.; Keller, K.L. *Marketing Management*, 14th ed.; Pearson Education Inc.: Cranbury, NJ, USA, 2012; pp. 310–312.
20. Palmatier, R.W.; Sridhar, S. *Marketing Strategy: Based on First Principles and Data Analytics*; Macmillan Publishers Limited: London, UK, 2017; pp. 267–270.
21. Hooley, G.; Piercy, N.; Nicoulaud, B.; Rudd, J.M. *Marketing Strategy & Competitive Positioning*, 6th ed.; Pearson Education Limited: London, UK, 2017; pp. 30–33.
22. Perloff, R.M. *The Dynamics of Persuasion: Communication and Attitudes in the 21st Century*, 2nd ed.; Lawrence Erlbaum Associates Inc.: Mahwah, NJ, USA, 2003; pp. 57–58.
23. Comrey, A.; Lee, H. *A First Course in Factor Analysis*; Lawrence Erlbaum Associates Inc.: Mahwah, NJ, USA, 1992; pp. 326–350.
24. Likert, R. A Technique for the Measurement of Attitudes. *Arch. Psychol.* **1932**, *22*, 5–54.
25. Silpcharu, T. *Statistical Data Analysis and Research by SPSS and AMOS*, 15th ed.; Business R&D Ordinary Partnership: Bangkok, Thailand, 2017; pp. 95–96.
26. Jump, N. *Psychometric Theory*, 2nd ed.; McGraw Hill Companies Inc.: New York, NY, USA, 1978; p. 84.
27. Arbuckle, J.L. *IBM®SPSS®Amos™ 20 User's Guide*; IBM: New York, NY, USA, 2011; pp. 597–617.
28. Yun, J.J.; Won, D.; Park, K.; Jeong, E.; Zhao, X. The role of a business model in market growth: The difference between the converted industry and the emerging industry. *Technol. Forecast. Soc. Chang.* **2019**, *146*, 534–562. [[CrossRef](#)]
29. Valmohammadi, C. Customer relationship management: Innovation and performance. *Int. J. Innov. Sci.* **2017**, *9*, 374–395. [[CrossRef](#)]
30. Nieves, J.; Osorio, J. Using information technology to achieve management innovation. *Acad. Rev. Latinoam. de Adm.* **2018**, *32*, 20–39. [[CrossRef](#)]
31. Ruiz-Torres, A.J.; Cardoza, G.; Kuula, M.; Oliver, Y.; Rosa-Polanco, H. Logistic services in the Caribbean region: An analysis of collaboration, innovation capabilities and process improvement. *Acad. Rev. Latinoam. de Adm.* **2018**, *31*, 534–552. [[CrossRef](#)]
32. Yun, J.J.; Park, K. How user entrepreneurs succeed: The role of entrepreneur's caliber and networking ability in Korean user entrepreneurship. *Sci. Technol. Soc.* **2016**, *21*, 391–409. [[CrossRef](#)]
33. Panda, S.; Rath, S.K. Strategic IT-business alignment and organizational agility: From a developing country perspective. *J. Asia Bus. Stud.* **2018**, *12*, 422–440. [[CrossRef](#)]
34. Yan, J.J.; Liu, Z. Micro and macro dynamics of open innovation with a quadruple-helix model. *Sustainability* **2019**, *11*, 3301. [[CrossRef](#)]
35. Rahman, M.S.; Mannan, M. Consumer online purchase behavior of local fashion clothing brands: Information adoption, e-WOM, online brand familiarity and online brand experience. *J. Fash. Mark. Manag. Int. J.* **2018**, *22*, 404–419. [[CrossRef](#)]
36. Yun, J.J.; Won, D.; Park, K. Entrepreneurial cyclical dynamics of open innovation. *J. Evol. Econ.* **2018**, *28*, 1151–1174. [[CrossRef](#)]
37. Guadagno, R.E.; Cialdini, R.B. Online persuasion: An examination of gender differences in computer-mediated interpersonal influence. *Group Dyn.* **2002**, *6*, 38–51. [[CrossRef](#)]
38. Matsumoto, D. *The Cambridge Dictionary of Psychology*; Cambridge University Press: New York, NY, USA, 2009; pp. 310–311.
39. Radziwon, A.; Bogers, M. Open innovation in SMEs: Exploring inter-organizational relationships in an ecosystem. *Technol. Forecast. Soc. Chang.* **2019**, *146*, 573–587. [[CrossRef](#)]
40. Sarmah, B.; Kamboj, S.; Kandampully, J. Social media and co-creative service innovation: An empirical study. *Online Inf. Rev.* **2018**, *42*, 1146–1179. [[CrossRef](#)]
41. Valaei, N.; Rezaei, S.; Emami, M. Explorative learning strategy and its impact on creativity and innovation: An empirical investigation among ICT-SMEs. *Bus. Process Manag. J.* **2017**, *23*, 957–983. [[CrossRef](#)]
42. Silva, A.; Simões, R. *Handbook of Research on Trends in Product Design and Development: Technological and Organizational Perspectives*; Business Science Reference: New York, NY, USA, 2011; pp. 62–64.
43. Wu, J.; Kang, J.M.; Damminga, C.; Kim, H.; Johnson, K.K.P. MC 2.0: Testing an apparel co-design experience model. *J. Fash. Mark. Manag.* **2015**, *19*, 69–86. [[CrossRef](#)]

44. Workman, J.; Lee, S.; Jung, K. Fashion trendsetting, creative traits and behaviors, and pro-environmental behaviors: Comparing Korean and U.S. college students. *Sustainability* **2017**, *9*, 1979. [[CrossRef](#)]
45. Coudounaris, D.N. Mediation of product design and moderating effects of reference groups in the context of country-of-origin effect of a luxury brand. *Rev. Int. Bus. Strategy* **2018**, *28*, 169–205. [[CrossRef](#)]



© 2020 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).