

Electronic Cigarette: The Influence of Lifestyle, Health Perspective and Product Characteristic to Switching Behaviour in Surabaya, Indonesia

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ABSTRACT

The purpose of this research is to understand the electronic cigarette user about their lifestyle profile, health perception, product experience and how this contribute to their switching behaviour from conventional cigarette to be e-cigarette user. This online survey with sample used consisted of 100 respondents in Surabaya, Indonesia - who are currently use electronic cigarette, as dual user or already fully switched from conventional cigarettes. Sampling was conducted randomly through an online questionnaire using a Likert scale. Data analysis was carried out using the Structural Equation Modeling (SEM) approach with the Partial Least Squares (PLS) methodology. The results of this research indicate that product experience use have significant and strong influence to the switching decision. Health perception also have significant and positive influence in switching behaviour, meanwhile the the Lifestyle apparently have weak influence to switching behaviour. The implication of this study can be used by business to tailor marketing communication strategy for middle-upper social segment where to emphasize more to the product experience and health benefit rather than lifestyle to support switching behaviour to electronic cigarettes from conventional cigarettes.

Keywords: *Electronic Cigarette, Lifestyle, Health Perception, Product Experience, Switching Behaviour.*

INTRODUCTION

E-cigarettes were originally developed as an alternative form of nicotine delivery and potential smoking cessation device. However, over the short period since their inception, they have transformed into high-tech nicotine delivery devices appealing to both non-smokers and youth, an outcome largely stemming from increased investment by the tobacco industry. This investment has contributed to their use moving beyond their touted role as a nicotine replacement and tobacco cessation device, to a social, recreational and sensory delivery device associated with new rituals and social practices.

Electronic cigarettes (e-cigarettes) are rapidly becoming a popular substitute for traditional tobacco cigarettes (Gordon, T., et al., 2022). This substitution appears to be driven by smokers' health concerns, the rising cost of tobacco cigarettes, and indoor smoking restrictions (Wang, R.J., et al., 2021). Numerous surveys and studies have shown that a significant number of smokers are significantly reducing their tobacco use and/or switching completely from tobacco cigarettes to ecigarettes (Marques, P., et al., 2021).

The electronic cigarette (e-cigarette) market has experienced a surge in growth, especially among adolescents and young adults in the United States, which prompted a series of government regulatory actions such as flavor product restrictions and e-cigarette taxes at various government levels. Although e-cigarette pose addiction risks among adolescents and young adults, they also have the

potential to help people who smoke combustible tobacco to quit smoking, making e-cigarette regulations challenging and controversial. Nonetheless, effective e-cigarette regulations require that policy makers weigh the benefits and risks of e-cigarettes.

Based on 6Wresearch.com, the Indonesia e-cigarette market size is projected to grow during 2022 – 2028. The trend of e-cigarette in the country is fueling the growth of this market in the most efficient manner. This market has become one of the most significant markets in the country. The e-cigarette is in its early stages, with small number of manufacturers and distribution channel, still, it is progressing well. With the introduction of e-cigarette, the preference of people are now shifting towards e-cigarette from conventional cigarettes. The changing behaviour and lifestyle are one of the major factors encouraging the market to grow efficiently. The growth of this market is attributed to the nation's growing population, growing awareness regarding e-cigarette, and growth in the number of smokers in the country.

In 2023, Indonesia are in the world's top ten in terms of smoking incidence, as well as the highest male smoker in the world whereas 7 out of 10 male in Indonesia are smoker. Based on WHO Global Adult Tobacco Survey 2021, in the course of 10 years, there was a very significant rise in the number of adults who had heard of electronic cigarettes, from only 10.9% in 2011 to 55.7% in 2021. The percentage of current electronic cigarette users saw a tenfold increase, from just 0.3% in 2011 to 3.0% in 2021. Based on GATS (Global Adult Tobacco Survey) on 2021, reasons for using electronic cigarettes among current e-smokers, disaggregated by demographic characteristics. Overall, the primary reasons for using electronic cigarettes among current electronic cigarette smokers were as a means for socializing (62.7%), flavors (62.6%), enjoyment from use (43.6%), and smoking cessation (30.3%). 22.9% of electronic cigarette users believed electronic cigarettes were less harmful than smoking tobacco products. This reason was reported mostly by those aged 15–24 years (25.7%), school students (28.9%), and self-employed individuals (26.5%).

The government has introduced a comprehensive new provision governing the production, distribution, and marketing of tobacco products and e-cigarettes in GR 28/2024. The tobacco and e-cigarettes industry has been a well-established and profitable industry for a long time due to its vast and growing market in Indonesia. With robust consumer demand and a large, youthful population, Indonesia offers a promising opportunity for investors seeking to enter or expand this industry within the region. The commercial appeal of tobacco products and e-cigarettes is increasingly viewed as desirable as these items are particularly sought among young consumers. Furthermore, the wide variety of flavors and sleek designs available for these products significantly enhance their attractiveness, contributing to their growing popularity among the youth. Surabaya city is selected as Surabaya is the second-largest metropolitan area in Indonesia.

In this article, we will cover electronic cigarette and heated tobacco products. Electronic cigarette are often called as e-cigarette or vaping devices. These devices are battery powered and heat liquid to produce a vapor or aerosol instead of smoke. Using these products is often called 'vaping'. Example of these product includes FUSE, RELX, Ploom, Blu. Heated tobacco products are heating tobacco sticks or capsules to produce vapor or aerosol. Examples of these products include IQOS and Glo.

Literature Review

Health Perception

The RACGP (Royal Australian College of General Practicioners), in light of the evidence limitations, recommends that e-cigarettes be prescribed only for fully informed people who have unsuccessfully tried other smoking cessation methods. An online survey of users of tobacco vaporizers

in 2018 were to explore about how these products are used and reason for utilization. The tobacco vaporizer was used mainly (in decreasing order of frequency) to replace cigarettes; because it was perceived to be less toxic than smoking tobacco; to stop smoking or to avoid starting smoking again; to reduce tobacco consumption with no intention of stopping (Banks et al., 2023).

One amongst six main factors influenced initiation and use of IQOS is the health reason, where people wanting to reduce/quit smoking and perceptions of reduced harm (while understanding IQOS was not risk-free). Branded packaging, absence of pictorial warnings and physical health improvements conveyed reduced harm. Popular reasons for using IQOS identified in a Swiss study included complete smoking cessation, the reduced toxicity relative to smoking, the reduced smell and the improved taste. Most users found IQOS weaker on the throat than combustible cigarettes and reported improved physical health, but feared becoming dependent. Participants commonly used IQOS to reduce the harms of smoking, also reflecting earlier findings. Perceptions of reduced harm relative to smoking were underpinned by messages that IQOS emits 95% less chemicals than cigarettes, and were reinforced by the cleanliness of using IQOS, the lighter sensory perceptions, the simple branding of HEETS packets with a text-only warning and the lack of pictorial health warnings. Optimism helped maintain the belief that IQOS was less harmful than smoking, yet participants understood that IQOS was not risk-free (Tompkins et al., 2019).

The National Academies of Science, Engineering, and Medicine in the United States concluded that e-cigarette use is likely far less hazardous than smoking. Policies intended to reduce adolescent vaping may also reduce adult smokers' use of e-cigarettes in quit attempts. Many scientists have concluded that vaping is likely substantially less dangerous than smoking because of the following; first because the number of chemicals in cigarette smoke, greater than 7000, exceeds that of e-cigarette aerosol by 2 orders of magnitude. Second, among potentially toxic substances common to both products, cigarette smoke generally contains substantially larger quantities than e-cigarette aerosol. However, e-cigarette aerosol contains some substances not found in cigarette smoke. Third, biomarkers reflecting exposure to toxic substances are present at much higher levels in exclusive cigarette smokers than in exclusive vapers, and studies of smokers who switch to e-cigarettes find decreases in toxicant exposures. Fourth, tests of lung and vascular function indicate improvement in cigarette smokers who switch to e-cigarettes. Exclusive users of e-cigarettes (most being former smokers) report fewer respiratory symptoms than do cigarette smokers and dual users. However, questions remain. Ongoing research will lend further insight into the products' absolute and relative dangers (Balfour et al., 2021).

H1 : *Lifestyle* has a significant effect to *Switching Behaviour*

Lifestyle

The initiation of e-cigarettes is facilitated by the influence of family or friends, the ability to vape in places where smoking is not allowed, the lower cost of e-cigarettes compared to tobacco cigarettes, the desire to reduce cigarette consumption or quit smoking and curiosity. In terms of ability, most buy e-cigarettes impulsively. Some informants started the initiative with the understanding that e-cigarettes have lower health risks than conventional cigarettes. In terms of opportunities, there is a strong interaction between social and physical opportunities for vaping, so family and friends often facilitate vaping, but in certain places, such as pubs, where smoking is not allowed. In terms of motivation, the act of e-cigarettes from hand to mouth seems to encourage some smokers to vape because it resembles smoking (Wadsworth et al, 2016).

H2 : *Health perception* has a significant effect to *Switching Behaviour*

Product Experience

Focus group studies in Switzerland and Japan found IQOS was more socially acceptable, cleaner and uptake was encouraged by 'clean and chic' marketing and less of a harsh feeling on the throat compared with cigarettes. The initiation of this heated tobacco product was encouraged by novelty and the sleek appearance of the device (Tompkins et al., 2019).

An online survey of users of tobacco vaporizers in 2018 were to explore about how these products are used and reason for utilization. With respect to product design, the majority of users perceived that the aerosol produced by the tobacco vaporizer was concentrated enough and quickly relieved the urge to smoke. Most participants in our study said it was easy to draw on the vaporizer and that it provided enough nicotine.

Based on qualitative study by Yanuar in 2020, result showed that informant have the perception of vaping is giving health benefit compared to conventional cigarettes, build self-confidence. There are also observation that after vaping about less breath smell, better sleep, less cough, lower cash monthly outlay, and could reduce addition to conventional cigarettes.

Quantitative study by Masan in 2023, concluded that slightly more than half of the respondents has good knowledge about e-cigarettes, with a positive attitude towards the use of e-cigarettes. In terms of positive attitudes, Half of the total respondents support the use of e-cigarettes. Respondents strongly agree that e-cigarettes are fun, e-cigarette advertisements are attractive, have the effect of helping solve problems, help reduce smoking habits, reduce stress, improve performance, increase concentration, and feel that e-cigarettes should be regulated by applicable law in Indonesia.

H3 : *Product Experience* has a significant effect to *Switching Behaviour*

Switching Behaviour

Human behavior occurs through a sequential process. Research (Notoatmodjo, 2007) reveals that before people adopt new behaviors, a sequential process occurs in the person, namely: (1) Awareness, i.e. the person is aware or knows the stimulus/object first, (2) Interest (interested), i.e. people begin to be interested in the stimulus, (3) Evaluation (considering whether the stimulus is good or bad for him). This means that the respondent's attitude has improved, (4) Trial, people have started to try new behaviors, (5) Adoption, subjects have behaved in new behaviors according to their knowledge, awareness, and attitude towards stimuli. Based on interview result, when using vapor, there is a change in lifestyle for people who use e-cigarettes. This can be seen from the appearance, as if vapor users are impressed as people who have more money and look cool.

Based on qualitative study by Yanuar in 2020, social media became one of the sources of vapor user information about references related to the vapor world. The problem faced by cigarette users is how to eliminate the addiction to tobacco cigarettes experienced by them so that they switch to e-cigarettes, for health and financial reasons.

Wadsworth qualitative study in 2016 concluded that e-cigarette initiation (behaviour) was facilitated by capability (physical capability to use an e-cigarette and psychological capability to understand that using e-cigarettes was less harmful than smoking); opportunity (physical opportunity to access e-cigarettes in shops, at a lower cost than cigarettes, and to vape in "smoke-free" environments, as well as social opportunity to vape with friends and family); and motivation (automatic motivation including curiosity, and reflective motivation, including self-conscious decision-making processes related to perceived health benefits).

Based on GATS (Global Adult Tobacco Survey) on 2021, reasons for using electronic cigarettes among current e-smokers, disaggregated by demographic characteristics. Overall, the primary reasons

for using electronic cigarettes among current electronic cigarette smokers were as a means for socializing (62.7%), flavors (62.6%), enjoyment from use (43.6%), and smoking cessation (30.3%). 22.9% of electronic cigarette users believed electronic cigarettes were less harmful than smoking tobacco products. This reason was reported mostly by those aged 15–24 years (25.7%), school students (28.9%), and self-employed individuals (26.5%).

Conceptual Framework:

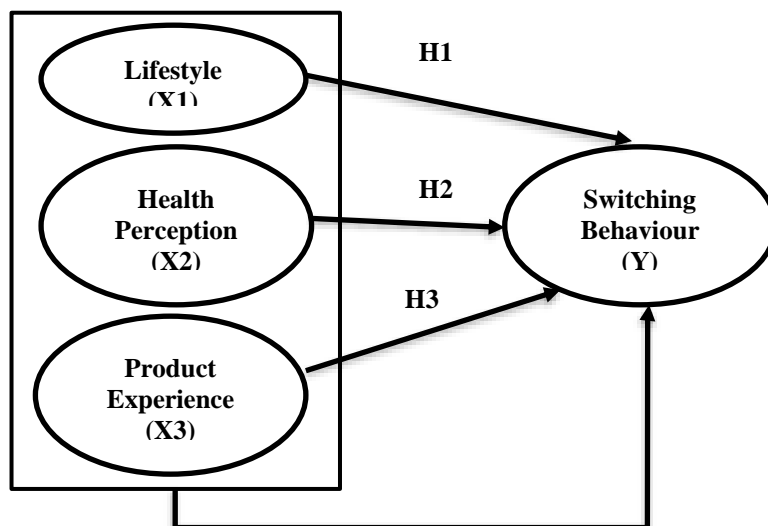


Figure 1. Conceptual Framework

METHOD

As e-cigarettes are mainly sold online, the internet is a logical way to reach users. We therefore posted a survey form on January until February 2025, for people domicile in Surabaya, Indonesia. Eligible participants were people (age above 18 years) that they had ever used e-cigarette and who provided the brand name of the e-cigarette that they had used most often. Subjects who did not name a brand were excluded, because this raised doubts about whether they had actually used an e-cigarette. On the survey form, participants shall be a former smoker (using conventional cigarette) which now using e-cigarettes as dual user or only user. They also provided the total number of days that they had been using e-cigarettes, the brand they used most often, and in addition, subjects indicated whether e-cigarettes had helped them to quit smoking conventional cigarettes. Participants were asked to supply their age, sex and city district.

The purposive sampling technique was chosen using leme show. Primary data sources were obtained through questionnaires distributed online to respondents via Google forms links with a Likert scale of 5 categories, namely:

Table 1. Likert scale of 5 categories

Response	Symbol	Score
Strongly agree	SS	5
Agree	S	4
Quite Agree	CS	3
Don't agree	TS	2
Strongly Disagree	STS	1

Research instruments that use the Likert Scale can be made in the form of a checklist or multiple choice. This questionnaire will later be distributed to 100 responded based in Surabaya, who are active user of e-cigarette or heated tobacco product.

The data collection technique in this study was a questionnaire, which is a number of written questions or statements used to obtain information from respondents.

The collected data will be processed with statistical analysis using Structural Equation Modeling (SEM) with Partial Least Squares (PLS) methodology. SEM-PLS was chosen because it can accommodate small sample sizes and is resistant to violations of normality assumptions. The analysis in the study was carried out in three stages, namely Outer Model Analysis, Inner Model Analysis, Hypothesis Testing.

The independent variables used in this study are Lifestyle, Health Perception, and Product Experience. Dependent variable is the Switching Behaviour.

Indicators of *Lifestyle (X1)* according to Chen Lyu study in 2022, namely

1. **Social acceptance:** associates the product with increased social acceptability, higher standing in society, and celebrating/praising others using the product (e.g., socially accepted, products do not bother non-smokers based on the social concern)
2. **Fun:** fun with friends, hip, enjoyment, happiness, being “cool”, contests, adventures.
3. **Success:** Self-image boosting as responsible, successful in appearance or actions Increase social status Enhance self-esteem and self-confidence
4. **Modern:** fashionable, revolutionary, realistic smoking experience

The indicator of *Health Perception (X2)* according to Chen Lyu study in 2022, namely:

1. **Harm Reduction:** For self: presents a message that e-cigarette is less harmful or safer for vapers themselves (e.g., light/low tar, no tar, free of tar and other carcinogenic substances, presence of less toxins than cigarettes, e-cigarette reduces risk of tobacco-related diseases). For others: presents a message about reduced risks or reduced harm or safer for others (e.g., product does not expose others to secondhand smoke, no secondhand smoking concerns based on the reduced harm)
2. **Health benefit:** short-term health (e.g., no smoker’s cough, ability to breathe better), long-term health (e.g., live longer, no risk of cancer), reduce stress, gain no weight, alleviates specific medical condition

The indicator of *Produce Experience (X3)* according to Chen Lyu study in 2022, namely:

1. **Enjoying the product everywhere:** Vaping freely: the product can be used to circumvent smoking restrictions (e.g., “smoke free laws”, “smoke-free rules”, “clean indoor air regulations” or “smoking bans”) or emphasizes the ability to use the product anywhere (e.g., offices, planes, restaurants, bars).
2. **Taste/Flavor:** Taste references the taste of the product (e.g., highlighting satisfaction, pleasure, freshness, long-lasting taste, aroma)
3. **Product Design:** Technology/device: Highlights the technology and/or device characteristics (e.g., battery type/size, revolutionary, break-through, sophisticated, electronic capability, “modern or revolutionary way to smoke”, “the product is rechargeable”). Quality: company ensures the excellence and quality of the electronic device and the liquid solutions, choosing valuable raw materials and making steady and accurate controls (e.g., highlighting organic or “pure” qualities of the products (e.g., no additives). Product safety: the product is safe technically. Durability: Information about usage life of e-cigarette product

4. **Benefit:** (e.g., “no smell”, “not gross”, “good smell”, and “customizable device”)

Data Processing Process

Data processing is the first step in data analysis, aimed at simplifying and tidying up the data that has been collected so that it is easier to manage and compile into a systematic report. There are several stages of data processing in this study, namely:

1. **Editing:** Check the data that has been collected to ensure there are no errors or omissions.
2. **Coding:** Assigning numerical codes to data to group respondents' answers.
3. **Entering Data (Tabulating):** Organizing data into a table to make it easier to read and analyze, such as calculating the average, median, or mode.

Data Analysis Methods

The data analysis method used is SEM-PLS with SmartPLS version 3. This model is component-based and does not require data with normal distribution, large sample sizes, or certain measurement scale assumptions. SEM-PLS can avoid the problems of inadmissible solutions and factor indeterminacy (Ghozali, 2018).

PLS does not require a specific distribution for parameter estimation, so parametric techniques for significance testing are not needed. PLS model evaluation is non-parametric, with the measurement model assessed through convergent and discriminant validity, and composite reliability. The structural model is assessed based on the R² (R Square) value for the dependent latent construct and path coefficient. The stability of the estimate is evaluated using the statistical t-test through bootstrapping (Ghozali, 2018).

Hypothesis Testing and Data Analysis Techniques

Hypothesis testing techniques and data analysis will be carried out using the PLS statistical application, and the results will be the basis for decision making. The analysis technique in this study has two stages, namely:

1. The research hypothesis testing was conducted using the Structural Equation Model (SEM) approach based on Partial Least Square (PLS). PLS is a component-based or variant SEM model, used to test complex and difficult-to-measure relationships simultaneously.
2. The second stage is a structural model test to evaluate the influence between variables and construct correlation using the t-test from PLS.

RESULTS AND DISCUSSION

Respondent Characteristics

The following is a review of the characteristics of respondents expressed in the form of a tabulation of respondent identities for 100 respondent samples.

Table 2. Respondent Characteristics

CHARACTERISTICS	N
Gender	
Man	64
Woman	36
Age (Years)	
18-25	28
26-40	54
> 40	18
Social Economy Status	
Upper	64
Middle	32
Lower	4
Domicile	
Surabaya Barat	27
Surabaya Timur	22
Surabaya Selatan	20
Surabaya Pusat	18
Surabaya Utara	13

From the data, it was found that the number of male respondents (64 people) was higher than the number of female respondents (36 people). In other words, there was a significant difference between the number of male and female respondents in the sample and this represent the male dominant in the tobacco industry. For social economy status, the majority of respondents come from upper social economy status, explains the purchasing power to the e-cigarettes.

Table 3. Descriptive Indicators

LIFESTYLE	
X1.1	How much do you agree with the statement that the use of e-cigarettes makes you more socially acceptable?
X1.2	How much do you agree with the statement that the use of e-cigarettes makes your association more enjoyable?
X1.3	How much do you agree with the statement that using e-cigarettes is in line with today's trends?
X1.4	How much do you agree with the statement that using e-cigarettes is appropriate for modern lifestyle?
HEALTH PERCEPTION	
X2.1	How much do you agree with the statement that e-cigarettes have lower health risks than conventional cigarettes?
X2.2	How much do you agree with the statement that using e-cigarettes makes you breathe better than conventional cigarettes?
PRODUCT EXPERIENCE	
X3.1	How much do you agree with the statement that e-cigarettes can be easier to use anytime, anywhere?
X3.2	How much do you agree with the statement that e-cigarettes have a variety of flavor and aroma?
X3.3a	How much do you agree with the statement that e-cigarettes have a quality product design

X3.3b	How much do you agree with the statement that e-cigarettes are more attractive because they can be personalized than conventional cigarettes?
X3.4a	How much do you agree with the statement that the use of e-cigarettes is safer for the people around you than conventional cigarettes?
X3.4b	How much do you agree with the statement that e-cigarettes are more comfortable to use than conventional cigarettes?
SWITCHING BEHAVIOUR	
Y1	How much influence do you think your lifestyle has on your decision to switch to e-cigarettes?
Y2	How much influence do you think the social environment has on your decision to switch to e-cigarettes?
Y3	How much do you agree with the statement that e-cigarettes help you reduce or quit conventional cigarettes?
Y4	How much do you think health perceptions influence your decision to switch to e-cigarettes?
Y5	How much do you think the ease of use of e-cigarettes affects your decision to switch to e-cigarettes?
Y6	How much do you think the taste of aroma influences your decision to switch to e-cigarettes?
Y7	How much influence do you think product design has on your decision to switch to e-cigarettes?
Y8	How much do you think product safety affects the people around you in making the decision to switch to e-cigarettes?
Y9	How much do you think the convenience of using the product affects your decision to switch to e-cigarettes?
Y10	How much influence do you think product personalization has had on your decision to switch to e-cigarettes?
Y11	How much influence do you think product price has on your decision to switch to e-cigarettes?

Evaluation of Measurement Model (Outer Model)

According to Ghozali (2015:39) the purpose of evaluating the outer model is to assess validity through convergent validity and discriminant validity, as well as the reliability of the model being evaluated composite reliability and cronbach's alpha for its indicator blocks.

1. Convergent Validity Test

Convergent validity testing is tested from each construct indicator. According to Chin (2015), an indicator is said to be valid if its value is greater than 0.70, while a loading factor of 0.50 to 0.60 can be considered sufficient. Based on this criterion, if there is a loading factor below 0.50, it will be dropped from the model.

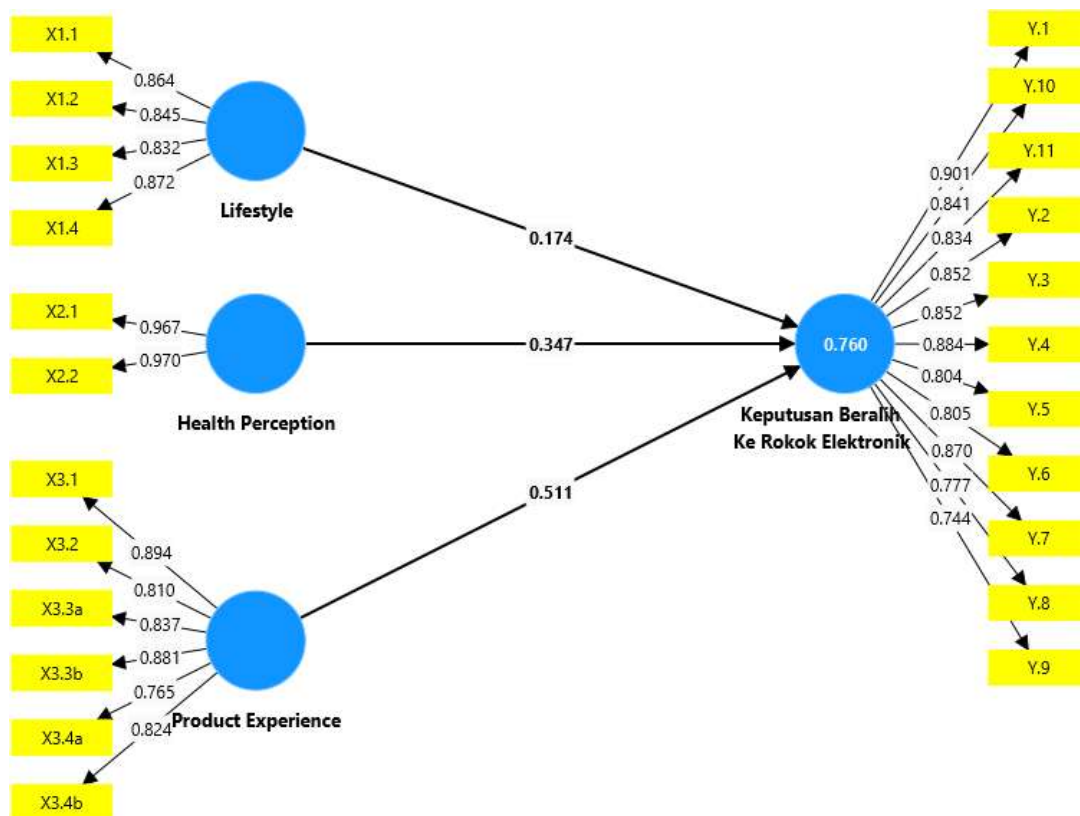


Figure 2. SmartPLS 4.0 Algorithm Results

Source: Processing Output with smartPLS 4.0

Table 4. Convergent Validity Test Result

	Lifestyle	Health Perception	Product Experience	Switching Behaviour
X1.1	0,864			
X1.2	0,845			
X1.3	0,832			
X1.4	0,872			
X2.1		0,967		
X2.2		0,970		
X3.1			0,894	
X3.2			0,810	
X3.3a			0,837	
X3.3b			0,881	
X3.4a			0,765	
X3.4b			0,824	
Y.1				0,901
Y.10				0,841
Y.11				0,834
Y.2				0,852
Y.3				0,852
Y.4				0,884
Y.5				0,804
Y.6				0,805
Y.7				0,870
Y.8				0,777
Y.9				0,744

Source: Processing Output with smartPLS 4.0

Based on the table above, it can be seen that all indicators of this research variable are declared valid, because the Outer Loadings value of each indicator is greater than 0.7. Thus, the questionnaire items can be used in further analyses.

2. Discriminant Validity Test

The next examination is to compare the correlation between variables with the root of AVE ($\sqrt{\text{AVE}}$). The measurement model has good discriminant validity if the $\sqrt{\text{AVE}}$ of each variable is greater than the correlation between variables. The $\sqrt{\text{AVE}}$ value can be seen from the Fornell Larcker Criterion Smart-PLS 4.0 Output presented in Table 5.

Table 5. Discriminant Validity Test Results (Fornell Larcker Criterion)

	Health Perception	Switching Behaviour	Lifestyle	Product Experience
Health Perception	0,969			
Switching Behaviour	0,706	0,834		
Lifestyle	0,360	0,583	0,853	
Product Experience	0,580	0,809	0,555	0,836

Source: Output Processing with smartPLS 4.0

From table 2 above, it can be concluded that the square root of the Average Variance Extracted for each construct is greater than the correlation between one construct and another construct in the model. The value based on the statement above, the construct in the estimated model meets the criteria for discriminant validity. Below are the results of Cross Loading:

Table 6. Cross Loading Results

	Lifestyle	Health Perception	Product Experience	Switching Behaviour
X1.1	0,864	0,266	0,436	0,445
X1.2	0,845	0,163	0,348	0,424
X1.3	0,832	0,224	0,510	0,435
X1.4	0,872	0,492	0,564	0,629
X2.1	0,389	0,967	0,548	0,664
X2.2	0,309	0,970	0,574	0,702
X3.1	0,519	0,489	0,894	0,691
X3.2	0,436	0,482	0,810	0,712
X3.3a	0,539	0,550	0,837	0,683
X3.3b	0,370	0,400	0,881	0,636
X3.4a	0,544	0,531	0,765	0,714
X3.4b	0,349	0,436	0,824	0,597
Y.1	0,616	0,568	0,753	0,901
Y.10	0,554	0,648	0,647	0,841
Y.11	0,393	0,601	0,732	0,834
Y.2	0,468	0,563	0,664	0,852
Y.3	0,564	0,671	0,674	0,852
Y.4	0,573	0,686	0,714	0,884
Y.5	0,355	0,536	0,722	0,804
Y.6	0,381	0,500	0,698	0,805

	Lifestyle	Health Perception	Product Experience	Switching Behaviour
Y.7	0,602	0,547	0,723	0,870
Y.8	0,412	0,590	0,542	0,777
Y.9	0,372	0,561	0,523	0,744

3. HTMT

Table 7. HTMT Results

	Heterotrait-monotrait ratio (HTMT)
Switching Behaviour <-> Health Perception	0,746
Lifestyle <-> Health Perception	0,371
Lifestyle <-> Switching Behaviour	0,612
Product Experience <-> Health Perception	0,623
Product Experience <-> Switching Behaviour	0,858
Product Experience <-> Lifestyle	0,601

Source: Processing Output with smartPLS 4.0

Meanwhile, the acceptable threshold level of discriminant validity is also obtained from the Heterotrait-Monotrait Ratio (HTMT) value which is less than 0.90 as suggested by (Hair et al., 2017). All HTMT values are lower than 0.9.

4. Average Variance Extracted (AVE)

The AVE value aims to measure the level of variation of a construct component collected from its indicators by adjusting the error rate. Testing with AVE values is more critical than composite reliability. The minimum recommended AVE value is 0.50. The AVE output obtained from Smart PLS 4.0 is presented in table 8.

Table 8. Average Variance Extracted (AVE) Test Results

	Average variance extracted (AVE)
Health Perception	0,938
Switching Behaviour	0,696
Lifestyle	0,728
Product Experience	0,699

Source: Processing Output with smartPLS 4.0

Based on table 5 above, it can be seen that the AVE value is greater than 0.50, which means that all indicators have met the established criteria and have potential reliability for further testing.

5. Composite Reliability and Cronbach's Alpha

To ensure that there are no measurement-related problems, the last step in evaluating the outer model is to test the reliability of the model. Reliability testing is carried out using the Composite Reliability and Cronbach's Alpha indicators. Composite Reliability and Cronbach's Alpha testing aims to test the reliability of the instrument in a research model. If all latent variable values have Composite Reliability and Cronbach's Alpha values ≥ 0.70 , it means that

the construct has good reliability or the questionnaire used as a tool in this study is consistent.

Table 9. Composite Reliability and Cronbach's Alpha Test Results

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)
Health Perception	0,934	0,936	0,968
Switching Behaviour	0,956	0,959	0,962
Lifestyle	0,877	0,906	0,915
Product Experience	0,913	0,914	0,933

Source: Processing Output with smartPLS 4.0

Based on table 6 above, it can be seen that the results of the Composite Reliability and Cronbach's Alpha tests show satisfactory values, namely all latent variables are reliable because all latent variable values have Composite Reliability and Cronbach's Alpha values ≥ 0.70 . So it can be concluded that the questionnaire used as a research tool is reliable or consistent.

6. Multicollinearity Test

Multicollinearity test is needed to determine the multicollinearity of each variable by looking at the correlation value between independent variables. If the VIF (Variance Inflation Factor) value has a value >5 then the model is free from multicollinearity. And the data from the multicollinearity test results in the study will be presented in the following table:

Table 10. Collinearity Statistics (VIF) Value

	Switching Behaviour
Health Perception	1,511
Lifestyle	1,451
Product Experience	1,903
Switching Behaviour	

Source: Processing Output with smartPLS 4.0

The calculation results in the table show that this study has a VIF value <5 , so all indicators do not experience multicollinearity problems. Outer model measurement is a stage used to evaluate validity and reliability.

Structural Model Evaluation (Inner Model)

Evaluation of the structural model in SEM with PLS was carried out by conducting a path coefficient. After the estimated model meets the Outer Model criteria, the next step is to test the structural model (Inner Model). Inner model testing is the development of a concept-based model from a theory in order to analyze the influence of exogenous and endogenous variables that have been described in the conceptual framework. The stages of testing the structural model (inner model) are carried out with the following steps: t-test and an R-Squared (R²) test.

1. Model Test

Table 11. Goodness of Fit Model Results

	Saturated model	Estimated model
SRMR	0,094	0,094
d_ ULS	2,437	2,437
d_ G	3,087	3,087
Chi-square	1252,320	1252,320
NFI	0,588	0,588

Source: Processing Output with smartPLS 4.0

The NFI value starts from 0 – 1 derived from the comparison between the hypothesized model and a certain independent model. Based on the table above, the NFI value is at 0.701 which means that it has a good model fit. (Ghozali, 2014).

2. R-Square (R²) test.

Looking at the R-Square value which is a test of the Goodness of Fit model.

Table 12. Results of the R-Square Value Test (R²)

	R-square	R-square adjusted
Switching Behaviour	0,760	0,752

Source: Processing Output with smartPLS 4.0

The R-Square (R²) value for the Decision to Switch to E-Cigarettes is 0.760. This indicates that the model can explain 76% of the variability in the decision to switch to e-cigarettes. This high R² value indicates that the model has a goodness of fit and is able to capture most of the factors that influence the decision. In addition, the adjusted R-square value of 0.752 indicates that after considering the number of variables in the model, the model still has a good fit. This confirms that this model is effective in predicting the decision to switch to e-cigarettes, with the remaining 24% of variability possibly influenced by other factors not included in the model.

3. f² Effect Size

The f-square (f²) value shows the magnitude of the partial influence of each predictor variable on the endogenous variable. Here is the interpretation of the f-square value (Ghozali, 2014):

- If the f-Square value is ≥ 0.35 , then it can be interpreted that the latent variable predictor has a strong influence.
- If the f-Square value is $0.15 \leq f \leq 0.35$, then it has a medium influence.
- If the f-Square value is $0.02 \leq f \leq 0.15$, then it has a weak influence.

Here are the results of the f² value of each exogenous variable on the endogenous variable:

Table 13. Results of the f2 Effect Size Test

	f-square
Health Perception -> Switching Behaviour	0,332
Lifestyle -> Switching Behaviour	0,087
Product Experience -> Switching Behaviour	0,571

Source: Processing Output with smartPLS 4.0

- Health Perception influence to Decision to Switch to Electronic Cigarettes: The f-square value for the influence of Health Perception on the Decision to Switch to Electronic Cigarettes is 0.332. This value indicates that Health Perception has a large effect on the decision to switch. In the context of the analysis, an f-square value above 0.35 indicates a strong influence, so it can be concluded that Health Perception significantly influences an individual's decision to switch to electronic cigarettes.
- Lifestyle influence to Decision to Switch to Electronic Cigarettes: For the influence of Lifestyle on the Decision to Switch to Electronic Cigarettes, the f-square value obtained is 0.087. This value indicates that the influence of Lifestyle on the decision to switch is relatively small. Although there is an influence, an f-square value below 0.15 indicates that Lifestyle does not have a significant impact in the context of this model, so its influence on the decision to switch can be considered weak.
- Product Experience influence to Decision to Switch to Electronic Cigarettes: The f-square value for the influence of Product Experience on the Decision to Switch to Electronic Cigarettes is 0.571. This value shows that Product Experience has a very large effect on the decision to switch. With an f-square value above 0.35, it can be concluded that Product Experience significantly influences an individual's decision to switch to e-cigarettes, making it one of the key factors in this model.

4. Q-Square (Goodness of Fit Model)

The Goodness of Fit Model structural test on the inner model uses the predictive relevance value (Q²). A Q-Square value greater than 0 (zero) indicates that the model has a predictive relevance value. The R-Square value of each endogenous variable in this study can be seen in the following calculation:

Table 14. Q-Square Test Results

	SSO	SSE	Q ² (=1-SSE/SSO)
Switching Decision	1100,000	535,547	0,513

Source: Processing Output with smartPLS 4.0

The Q-Square test results show an SSO (Sum of Squares Observed) value of 1100,000 and an SSE (Sum of Squares Error) of 535.547. Using the formula $Q^2 = 1 - (SSE / SSO)$, a Q² value of 0.513 is obtained. A Q² value greater than 0 indicates that the model has a good predictive relevance value. This means that this model is able to explain more than 51% of the variability in the Decision to Switch to Electronic Cigarettes, so it can be considered a good model in predicting the decision.

5. Hypothesis Testing Results (Path Coefficient Estimation)

The estimated value for the path influence in the structural model must be significant. This significant value can be obtained by the bootstrapping procedure. Seeing significance in the hypothesis by looking at the parameter coefficient value and the significant value of the t-

statistic in the bootstrapping report algorithm. To find out whether it is significant or not, see the t-table at alpha 0.05 (5%) = 1.96. Then the t-table is compared with the t-count (t-statistic).

Table 15. Hypothesis Testing Results

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STD EV)	P values
Health Perception -> Switching Behaviour	0,347	0,337	0,087	3,989	0,000
Lifestyle -> Switching Behaviour	0,174	0,180	0,066	2,616	0,009
Product Experience -> Switching Behaviour	0,511	0,517	0,096	5,302	0,000

Source: Processing Output with smartPLS 4.0

The following are the results of hypothesis testing on the structural model:

- Health Perception influence to Decision to Switch to Electronic Cigarettes: The estimated value of the path coefficient for the influence of Health Perception on the Decision to Switch to Electronic Cigarettes is 0.347. With a t-statistic value of 3.989 and a p-value of 0.000, these results indicate that the influence of Health Perception on the decision to switch is very significant. Because the t-count (3.989) is greater than the t-table (1.96) at alpha 0.05, the hypothesis stating that Health Perception influences the decision to switch can be accepted.
- Lifestyle influence to Decision to Switch to Electronic Cigarettes: For the influence of Lifestyle on the Decision to Switch to Electronic Cigarettes, the estimated value of the path coefficient is 0.174. The t-statistic obtained is 2.616 with a p-value of 0.009, which indicates that the influence of Lifestyle is also significant. T-count (2.616) is greater than t-table (1.96), so the hypothesis stating that Lifestyle influences the decision to switch can be accepted.
- Product Experience influence to Decision to Switch to Electronic Cigarettes: The estimated value of the path coefficient for the influence of Product Experience on the Decision to Switch to Electronic Cigarettes is 0.511. With a t-statistic of 5.302 and a p-value of 0.000, these results indicate that the influence of Product Experience on the decision to switch is very significant. T-count (5.302) is much greater than t-table (1.96), so the hypothesis stating that Product Experience influences the decision to switch can be strongly accepted.

Hypothesis Testing (Resampling Bootstrapping)

Hypothesis testing uses the bootstrapping method with the T test statistic. This method does not require the assumption of normal distribution or large samples. The hypothesis is accepted. The hypothesis is accepted if P-Values <0.05. (Alpha 5%). The t-table value of 0.05 (5%) is 1.96. So it can be concluded that the hypothesis is accepted if the t-statistic > t-table is stated as significant and vice versa. If the results of the hypothesis test on the outer model are significant, it indicates that the indicator is considered to be used as a measuring instrument for latent variables.

CONCLUSION AND SUGGESTIONS

Conclusion

Based on the analysis of the research results and discussions that have been described previously, the results of this study can be concluded that in Surabaya the product experience use have significant and strong influence to the switching decision. Health perception also have significant and positive influence in switching behaviour, meanwhile the the Lifestyle apparently have weak influence to switching behaviour. The result about lifestyle is not inline with the GATS (Global Adult Tobacco Survey) on 2021, where the means of socializing is the primary reason for using electronic cigarette (62.7%). Looking at the social economic of respondents which 96% coming from middle-upper segment, which have more tendency to choose product experience and health reason to justify the switching to electronic cigarettes rather than lifestyle.

The implication of this study can be used by business to tailor marketing communication strategy for middle-upper social segment where to emphasize more to the product experience and health benefit rather than lifestyle.

Suggestion

The researcher also suggests that the opportunity can be used to explore broader topics from the variables that have been studied in this study or to complete the shortcomings in this study or to expand the research to more urban area in order to help business to build the marketing strategies.

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