The study of online reviews and its relationship to online purchase intention for electronic products among the millennials in Malaysia

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Abstract

Purpose – The purpose of this research is to examine the type of online reviews (review timeliness, review quantity, and review valence) and its relationship toward online purchase intention for electronic products among millennials in Malaysia.

Design/methodology/approch – The quantitative approach and simple random sampling methodology were used in this research. Data were gathered through a survey instrument, and the partial least squares structural equation modeling (PLS-SEM) technique was subsequently applied to 215 responses. The model explained 36.3 percent variation of the major constructs in relation to online purchase intention of electronic products amongst Malaysian millennials.

Findings – Review timeliness is the most influential online reviews element towards Malaysian millennials' online purchase intention for electronic products.

Originality/value – This research project has provided the researcher and marketers with more clarity into the area of online purchase intention for electronic products, which is a volatile and dynamic area with continuous uncertainty.

Keywords Online purchase intention, Review timeliness, Review quantity, Review valence

Paper type Research paper

Introduction

The number of Internet users has grown 1695.6 percent, from 114 million Internet users (2000) to 1,938 million Internet users (2017); in Malaysia, the number has increased by 1.3 percent, with 24,554,255 Internet users in 2017 (Internet World Stats, 2017b). Some studies found that millennials dominated the online populations and are more familiar with e-commerce than older generations, even though a large percentage of older generations and younger generations are online (Mazzini *et al.*, 2016). Besides that, consumers today are more likely to use the Internet environment to find information about products and services that consumers intend to purchase, and share the products and services reviews with other users through online platforms (Kim and Park, 2013; Beneke *et al.*, 2015).

According to Sutanto and Aprianingsih (2016), electronic word of mouth (e-WOM) has a larger influence than traditional word of mouth in spreading information, regardless the information is a positive statement or a negative statement about the product or service. Online reviews can be defined as the evaluation and opinions of consumers about the products and services that the consumers have purchased previously (Zhang *et al.*, 2014). Based on Local Consumer Review Survey 2017, the results showed that 97 percent of

consumers read online reviews for local businesses, while 54 percent of consumers were influenced by the review valence, 46 percent of consumers influenced by review quantity, and 38 percent of consumers influenced by review timeliness (BrightLocal, 2017). Many studies found that online reviews have a significant impact on online purchase intention on social media and shopping on websites (Zhao et al., 2015; Erkan and Evans, 2016).

Online purchase intention represents the willingness and intention of consumers toward a product to be purchased at a specific time or in a specific situation via online transaction platform (Lu et al., 2014). Online purchase intention is a significant predictor of actual purchase (Lee and Lee, 2015 as cited in Aliyar and Mutambala, 2015). According to Zhao et al. (2015), review timeliness is the extent to which the reviews are up-to-date. The more recent the reviews, the more consumers are attracted to gain attention, which tends to increase the purchase intention (Jindal and Liu, 2008 as cited in Zhao et al., 2015). Previous studies have showed that the popularity of product will be measured by the large quantity of positive reviews that are able to convince people to buy the product (Park et al., 2007 as cited in Huyen and Costello, 2017). Many studies found that the review valence is one type of information that provides positive and negative reviews on a product. The review valence is used to provide statements about the product to enable the consumers to evaluate the product that influences consumers' purchase intention and decision (Lopez and Sicilia, 2014; Park and Lee, 2009; Cheung and Thadani, 2012 as cited in Sutanto and Aprianingsih, 2016).

One of the key elements in better comprehending online purchase intentions is by linking in recognizing and understanding Malaysian millennials from a "Confucius Chopstick Concept" as postulated by Fam et al. (2009). Their concept relates to the overbearing need of having an appreciation in context to customs, traditions, values, and consumer behavior. They further reiterate that "The Confucian ethic is omnipresent and relevant to every aspect of family life, social gathering, and business activity" (Fam et al., 2009, p. 393). These further signal the need to embrace the underpinnings of the "Confucius Chopsticks Concept" in relation to better understanding of Malaysian millennial antecedents relating to actual online purchase of electronic products.

Therefore, the purpose of this research aims to investigate review timeliness, review quantity, and review valence in relation to its impact on online purchase intention.

Literature review
Online purchase intention
According to Erkan and Evans (2016), the researchers conducted a study to examine the factors that influence consumers to prefer anonymous reviews rather than friends' recommendations on social media. Ten university students were chosen to be part of in-depth interviews. Some interviews stated that online reviews on shopping websites were much better and reliable than friends' recommendation on social media. For example, in the shopping websites, the online reviews can be up to 300 reviews, while friends' recommendations are extremely limited. Large quantity of reviews allowed consumers to understand the overall opinion about the product and showed that something must be good about the product when the large number of reviews were positive. The result showed that one of the main reasons and critical role that enable shopping website to become more favorable and ultimately increase consumers purchase intention was number of reviews. The researchers Erkan and Evans (2016) stated that online reviews play an important role to cover the anonymity issue about the online reviews on shopping websites.

See-To and Ho (2014) mentioned that electronic word of mouth (e-WOM) is one of the inexpensive online reviews which affect the purchase intention in social network sites (SNSs). Previous research stated that positive e-WOM increases purchase intention, and negative e-WOM reduces purchase intention. According to Chan and Ngai (2011) and See-To and

Ho (2014), e-WOM influences purchase intention through the impact of e-WOM on consumers' trust and value co-creation. The findings showed that the impact of e-WOM in SNS is an important proposition for marketers which can help marketers design a better method to propagate the marketing messages through SNS and develop the positive e-WOM for the firms and the products and services.

Review timeliness

The message which is current, timely, and up to date is considered as review timeliness (Sa'ait *et al.*, 2016). Somohardjo (2017) mentioned that review timeliness referred to the date of online reviews that were posted on the Internet environment. Many studies concluded that review timeliness is the extent to which the reviews are up-to-date; readers generally ignored the old online reviews. According to Jindal and Liu (2008), the more updated the reviews, the more attention they get from consumers, and as such increase the consumers' purchase intention. Gretzel *et al.* (2007) found that 59.3 percent of respondents rated the most recent online reviews as more critical than old online reviews, because the information is up-to-date and reliable. Past research stated that the messages that are outdated cannot deliver reliable, desired, and valid results (Madu and Madu, 2002). Besides that, the reviews that are not up-to-date provided no added value, and generally confuse the reviewers' purchase intention negatively.

Zhao *et al.* (2015) showed that review timeliness had a positive impact on the online hotel booking intention in Mainland China. The up-to-date information is valuable for consumers to evaluate and arouse consumers' booking intention. Sa'ait *et al.* (2016) concluded that in Kota Samarahan, Sarawak, Malaysia, review timeliness had significant relationship with purchase intention; however, review timeliness was the least affected element compared with other online review elements toward purchase intention (such as review relevance, review accuracy, and review comprehensiveness).

In addition, Wu and Huberman (2007) stated that memory and the newness of online reviews will expire with the effluxion of time. However, Pan and Zhang (2011) concluded that old online reviews are more helpful than expected. Numerous studies found that there was no significant relationship between review timeliness and consumer purchase intention (Cheung *et al.*, 2008; Zheng, 2008). Somohardjo (2017) stated that online reviews play an important role in consumers' final purchase intention, and the number of consumers using online reviews is growing continually. The researcher found that review timeliness has a negative non-significant effect on purchase intention to meals in a restaurant. Since there was no statistical evidence found in the research, there was no conclusive claim. This leads to the following hypothesis: there is a significant correlation between review timeliness and online purchase intention for electronic products among millennials in Malaysia.

Review quantity

According to Lascu *et al.* (1995), review quantity can influence the consumers' previous opinion and attitudes toward consumers' purchase intention. The greater the volume of reviews, the lesser difficult it would be to persuade the consumers' purchase intention with positive reviews. Huyen and Costello (2017) stated that the volume of reviews generally reduced risk exposure due to reinforcement of confidence in consumers. However, Xiaorong *et al.* (2011) found the significant relationship between review quantity and purchase intention with the larger quantity of reviews had a higher effect on consumer purchase intention. Numerous studies found that the larger the quantity of reviews with positive feedback and recommendations for products, the more favorable attitude consumers tend to have toward the products (Cacioppo and Petty, 1984; Park *et al.*, 2007).

Previous studies showed that the popularity of product will be measured by the review quantity, and huge numbers of reviews were able to convince people to buy the product

(Park *et al.*, 2007). Cheung and Thadani (2012) and Aljahdali (2016) concluded that high quantity of online reviews can reduce the feelings of anxiety and uncertainty in consumers and reflect that the product that consumers intend to purchase is popular. Tsao *et al.* (2015) mentioned that large quantity of online review represents high level of concern over the issue in question. Huyen and Costello (2017) found that the review quantity has significant effect on purchase intention; for example, with the large quantity of coffee shop reviews, the extent of brand's buying intention in Hanoi, Vietnam, was higher. If there is large volume of positive reviews, which are perceived as non-commercial recommendations, they provided stronger confidence and positive attitude about the brand toward consumers' purchase intention. In addition, the researchers also stated that large quantity of online reviews not only shared opinion and influenced other consumers, but also inspired others to try the product or service when consumers were searching for a specific product or brand.

Wensi (2017) further reiterated hotel purchase intention as the situation in which customers browse hotel review websites to choose a hotel room. The researcher concluded that 70 percent of Chinese respondents agreed that large quantity of negative reviews on TripAdvisor tended to reduce the Chinese consumers' hotel booking intention. From the findings, crowd mentality is one of the behaviors that majorly influenced Chinese consumers' purchase intention. Tsao *et al.* (2015) examined the effect of review quantity toward hotel booking intention and the interaction effects between conformist and non-conformist. The finding found that large number of reviews is more persuasive and will affect the booking intention when consumers are conforming, but had no effect on consumers with low conformity. This leads to the following hypothesis: there is a significant correlation between review quantity and online purchase intention for electronic products among millennials in Malaysia.

Review valence
Review valence is information that provides positive and negative review on a product. Generally, consumers will use review valence to evaluate the product and service. Positive reviews have higher impact to influence consumers' purchase intention and decision (Park and Lee, 2009; Cheung and Thadani, 2012; Lopez and Sicilia, 2014). Previous studies found that positive reviews will increase the product's purchasing strength and consumers' purchase intention (Cheung *et al.*, 2009; Cheung and Thadani, 2012; Utz *et al.*, 2012). According to Sutanto and Aprianingsih (2016), the number of Internet users kept increasing with the growth of cosmetics industry in Indonesia. The study found that review valence had significant and positive relationship for premium cosmetic purchase intention amongst female Indonesians youths. Besides that, Sutanto and Aprianingsih (2016) also found that Indonesians are most likely to follow others that influence Indonesians' purchase intention and decision. The researchers concluded that the more the positive reviews, the higher the purchase intention for the premium cosmetic reviewed.

Numerous studies found no significant effect of review valence toward online purchase intention (Liu, 2006; Duan *et al.*, 2008; Cheung *et al.*, 2009). Few studies have reported the asymmetrical effects, but most of the studies were not convincingly in their respective fields of research (Lee and Koo, 2012; Wu, 2013). Therefore, those studies that found negative valence weighed more heavily than positive valence in terms of purchase intention. But some studies found the positive reviews weigh more strongly than negative reviews in the consumers' purchase intention and judgment (East *et al.*, 2008). Ketelaar *et al.* (2015) found that the expert consumers had a negative bias and were likely to pay more attention to negative reviews, and are less affected by positive reviews toward expert consumers' purchase intention for cameras.

According to Purnawirawan *et al.* (2015), the study was a meta-analysis investigation about the role of review valence in online reviews. The purpose of the study was to examine
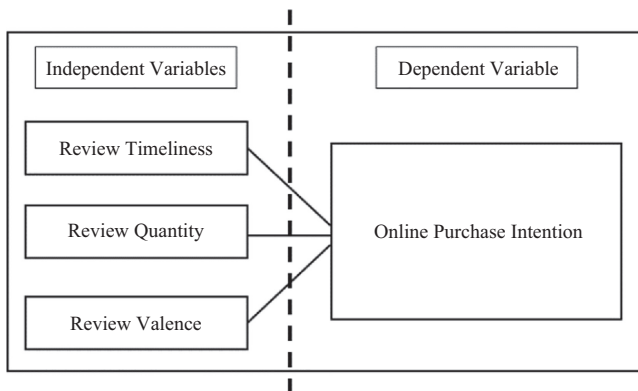
the influence of online review valence on various dependent variables such as attitude, perceived usefulness, purchase intention, recommendation intention, and credibility. Google Scholar was used as electronic database to computerize bibliographic search. The researchers Purnawirawan *et al.* (2015) searched the relevant journals manually, then identified and examined the references in a search of various studies. The findings of the study showed that the valence of online reviews has significant effect on purchase intention. The researchers also found that online review valence had stronger effect on recommendation intention, while only 5 percent of online review valence was explained in context to purchase intention. This leads to the following hypothesis: there is significant positive correlation between reviews valence and online purchase intention for electronic products among millennials in Malaysia.

Research framework

Methodology
Quantitative approach is a deductive research which utilizes structured approach, statistics, and large sample size to analyze data. Looking at the sampling methodology, the population of this research is Malaysians, while the sample refers to the Malaysian millennials. Most of the studies conducted in other countries focused on the town or city of the country; therefore, Kuala Lumpur is selected as location of research. Based on sampling methodology, this research uses simple random sampling methodology (Sa'ait *et al.*, 2016; Huyen and Costello, 2017), which affirms that every potential millennial in Malaysia has an equal chance to participate in this research.

The data collection process was conducted among Malaysians who were able to access the Federal Territory of Kuala Lumpur through online distribution. For sample size consideration, there were 1.79 million of Malaysians in Kuala Lumpur in year 2017, which is considered as a large sample group. According to Raosoft Inc (2018), the results from Raosoft Sample Size Calculator suggested that 385 is the minimum sample size of the survey (margin of error = 5 percent; confident level = 95 percent).

The total number of respondents targeted was 385. The inclusion criterion in respondent selection is that the individual had to be using online purchase of electronic products. This research uses five-point Likert scale for the survey statements. To calculate the various measurements in this research; five points were given if the individual strongly agreed with the statement, four points were given if the individual agreed with the statement, three points

were given if the individual neither agreed nor disagreed with the statement, two points were given if the individual disagreed with the statement, and one point was given if the individual strongly disagreed with the statement.

In this research, SPSS was used to measure and identify the relationship between respondents' characteristics and dependent variable in this study. In addition, according to Sarstedt *et al.* (2014), PLS-SEM is a useful tool for family business research, and this model is widely used in many fields of business research. PLS-SEM was used to measure and evaluate the reflective measurement and structural measurement.

There are two stages for this model; stage one is to measure the reflective model (Nimako *et al.*, 2014). In the beginning, indicators reliability, internal consistency reliability, convergent validity, and discriminant validity were assessed in reflective model. It is important to also measure the collinearity, predictive relevance, significance, and relevance of path coefficients in the context to overall structural measurement of the model.

Data validation and analysis

Respondents' characteristics

Table I shows the profile of respondents who had participated in the online survey. A total of 385 survey questionnaires were distributed to millennials in Federal Territory of Kuala Lumpur, Malaysia, but only 236 (61.3 percent) of respondents participated in this research. Out of the 236 responses, 21 responses were rejected due to inappropriately answered survey questionnaires; therefore, only 215 responses were valid and eligible to be used for further analysis. In this research, the f male respondents were 102 (47.7 percent), while female respondents were 113 (52.6 percent).

In addition, as this study was focused on millennials in Malaysia, the terms of age group were limited and divided into two groups, which were 18–27 and 28–36. Based on the results from Table I, majority of the respondents were aged between 18 to 27 years (91.2 percent, 196 respondents), while only 19 respondents were aged between 28 to 36 years . As for the nationality, all the respondents were Malaysian, which fulfilled the basic requirement of the research. In terms of education level, majority of the respondents were undergraduates (103; 47.9 percent). Respondents in diploma level were 57 (26.5 percent), postgraduates were 28 (13 percent), and SPM level were 27 (12.6 percent). The descriptive statistics showed that majority of the millennials that participated in this research were undergraduates.

Variables	Number (n)	Percentage (%)
Gender		
Male	102	47.4
Female	113	52.6
Age		
18 to 27	196	91.2
28 to 36	19	8.8
Nationality		
Malaysian	215	100
Education level		
SPM	27	12.6
Diploma	57	26.5
Undergraduate	103	47.9
Postgraduate	28	13

Table I.
Respondents' profile

Reflective measurement model
Sarstedt *et al.* (2014), Nimako *et al.* (2014), and Gorondutse and Hilman (2016) mentioned the reflective measurement as the first stage of the evaluation in examining the reliability and validity of the measurement model. The reason for only using reflective measurement in this research was because all the latent variables in this research were from the construct to the indicators, which were endogenous latent variables. Therefore, this section will be divided into several subtopics: (1) indicator reliability (loadings), (2) construct reliability, (3) convergent validity and, (4) discriminant validity.

Indicator reliability (loadings). According to Sartedt *et al.* (2014), the researchers stated that examining the indicator loadings was the first step in the reflective measurement, and the loadings score above 0.7 represented that the construct explained more than 50 percent of a variable. Based on Table II, the results showed that all the indicators were over 0.7, except the "first choice" indicator. The results showed that the loadings score of indicators to online purchase intention included video (0.7302), reading reviews (0.8285), willing to purchase (0.7742), first choice (0.6789), and to continue purchasing (0.8007) accordingly. Furthermore, the loadings score of indicators to review timeliness were instant reviews (0.7840), recent reviews (0.9297), and reflect latest (0.8658). The loadings score of indicators to review quantity were popular (0.8296), good quality (0.7724), and satisfy needs (0.8189). Moreover, the loadings score of decrease interest, choose other, evaluate positively, and recommend others were 0.7862, 0.7906, 0.8122, and 0.7927, respectively, to the construct of review valence. Therefore, most of the indicators were highly reliable for the measurement of each construct, with the highest loadings score of 0.9297 (recent reviews to review timeliness) and the lowest loadings score of 0.6789 (first choice to online purchase intention).

Internal consistency reliability. Internal consistency reliability was used to examine the reflective measurement model, where previous studies stated that the higher the value indicator, the higher the degree of reliability (Joseph *et al.*, 2010; Gorondutse and Hilman, 2016). In addition, Jöreskog's rho (p_c) was the common method used to evaluate the internal consistency reliability. According to Sarstedt *et al.* (2014), the minimum acceptable value for internal consistency reliability was 0.6, while the maximum value was 0.95. Drolet and Morrison (2001) stated that the value below 0.6 was considered as low significance or weak reliability, and the value over 0.95 was considered as problematic or the indicator was redundant. Based on Table III, the result showed that the Jöreskog's rho (p_c) values for each

Indicator	Online purchase Intention	Review Timeliness	Review Quantity	Review Valence
Seeing video	0.7302			
Reading reviews	0.8285			
Willing to purchase	0.7742			
First choice	0.6789			
Continue purchasing	0.8007			
Instantly reviews		0.7840		
Recently reviews		0.9297		
Reflect latest		0.8658		
Popular			0.8096	
Good quality			0.7724	
Satisfy needs			0.8189	
Decrease interest				0.7862
Choose other				0.7906
Evaluate positively				0.8122
Recommend others				0.7927

Table II.
Indicated
multicollinearity

APJML

construct, that is, online purchase intention (0.8749), review timeliness (0.8961), review quantity (0.8425), and review valence (0.8733), ranged within 0.7 and 0.95. Therefore, all the Jöreskog's rho (ρ_c) values in this research were considered as "satisfactory to good," and all of the indicators in this research were significant and reliable for the internal consistency reliability.

For the extent of internal consistency reliability and construct reliability, Cronbach's alpha was used to measure and examine the reliability for all the constructs. According to Joseph *et al.* (2010), the minimum acceptable Cronbach's alpha is 0.7 or above, while the researcher Nimako *et al.* (2014) stated that the higher the Cronbach's alpha, the higher the reliability of multiple measures for the measurement of each construct. Based on the results from Table III, all the constructs were higher than the standard requirement (0.7) with online purchase intention (0.8212), review timeliness (0.8249), review quantity (0.7199), and review valence (0.8096).

Convergent validity. According to Hair *et al.* (2011) and Sarstedt *et al.* (2014), convergent validity is used to measure and examine the extent that a construct converges with the specific construct's indicators by explaining the items' variance. Commonly, the average variance extracted (AVE) will be used to measure for all items that associated with each construct. According to Jamil (2012) and Sarstedt *et al.* (2014), the mean of the squared loadings for all indicators associated with the construct is the calculation method to calculate the value of AVE. In addition, the minimum acceptable value for AVE is 0.5, and if the value is more than 0.5, the result represented that the construct explains more than 50 percent of the variance of items. Based on the result from Table IV, all the AVE values for the constructs in this research were exceeding 0.5, which were online purchase intention (0.5842), review timeliness (0.7428), review quantity (0.6409), and review valence (0.6328). As all the AVE values were exceeding 0.5, the convergent validity was established in this research.

Discriminant validity. Discriminant validity was the final step in the reflective measurement model after the indicator reliability, internal consistency reliability, and convergent validity were successfully established. According to Jamil (2012), Hair *et al.* (2013), and Sarstedt *et al.* (2014), discriminant validity methods used to measure the different constructs differ from one another, in terms of how much a variable correlates with other variables and how much the indicators represent only a single variable. There are two methods to measure and evaluate the discriminant validity: Fornell-Larcker criterion and cross-loadings (Jamil, 2012; Hair *et al.*, 2013; Sarstedt *et al.*, 2014).

Construct	Jöreskog's rho (ρ_c)	Cronbach's alpha (α)
Online purchase intention	0.8749	0.8212
Review timeliness	0.8961	0.8249
Review quantity	0.8425	0.7199
Review valence	0.8733	0.8096

Table III.
Construct reliability

Construct	Average variance extracted (AVE)
Online purchase intention	0.5842
Review timeliness	0.7428
Review quantity	0.6409
Review valence	0.6328

Table IV.
Convergent validity

Based on the results from Table V, the AVE value of online purchase intention with the construct of online purchase intention was 0.5842, which was higher than the square of inter-construct correlation; the AVE value of review timeliness with the construct of review timeliness was 0.7428, which was higher than the squared of inter-construct correlation; the AVE value of review quantity with the construct of review quantity was 0.6409, which was higher than the square of inter-construct correlation; and the AVE value of review valence with the construct of review valence was 0.6328, which was higher than the squared of inter-construct correlation.

Structural model assessment
Before the structural model assessment, the potential collinearity between the predictor constructs must be tested to ensure the results were not biased by collinearity issues. Therefore, this section will be divided into several subtopics: (1) collinearity, (2) predictive relevance and, (3) significance and relevance of path coefficients.

Collinearity. In order to ensure the results were not biased by collinearity issues, variance inflation factor (VIF) was used to measure for each indicator in the construction. According to Hair *et al.* (2011), Sarstedt *et al.* (2014), and Hernández-Perlines and Cisneros (2017), the value of VIF should not be more than 5 because if the value exceeded 5, the collinearity issues would be found and the results would not be accurate. Based on the results from Table VI, all the indicators' VIF values were below 5, which represented that there were no collinearity issues observed.

Predictive relevance (R^2). After having confirmed of no collinearity issues in this research, coefficient of determination (R^2) was used to measure how well the construct was explained

Construct	Online purchase Intention	Review Timeliness	Review Quantity	Review Valence
Online purchase intention	*0.5842*			
Review timeliness	0.3021	*0.7428*		
Review quantity	0.2315	0.2925	*0.6409*	
Review valence	0.1991	0.2640	0.3146	*0.6328*

Table V.
Discriminant validity

Indicator	Online purchase Intention	Review Timeliness	Review Quantity	Review Valence
Seeing video	1.8146			
Reading reviews	2.1712			
Willing to purchase	1.7476			
First choice	1.4155			
Continue purchasing	1.7178			
Instantly reviews		1.5901		
Recently reviews		2.8607		
Reflect latest		2.3120		
Popular			1.5041	
Good quality			1.3305	
Satisfy needs			1.4491	
Decrease interest				2.3076
Choose other				2.3371
Evaluate positively				1.6371
Recommend others				1.6020

Table VI.
Indicated reliability

toward all the constructs in the research. According to Hair *et al.* (2011) and Hernández-Perlines and Cisneros (2017), the minimum requirement of R^2 was 0.2, and the construct was relevant and significant if the value of R^2 exceeded 0.2. Based on the result from Table VII, the value of R^2 was 0.363, which represented that the construct was relevant and significant, but considered as moderately low in explaining all the variables in the research (Jamil, 2012; Hair *et al.*, 2013; Sarstedt *et al.*, 2014).

Significance and relevance of path coefficients. The final step in the structural model assessment was significance and relevance of path coefficients. According to Sarstedt *et al.* (2014), the researchers stated that the standard range for path coefficient values was from -1 to +1 one, while the value closer to +1 represented strong positive relationship, and the value closer to -1 represented strong negative relationship. The results from the bootstrapping procedure (215 cases, 1000 samples, no sign changes option) reveal that four of three structural relationships were significant ($p \leq 0.05$). Based on the standard bootstrap results in Table VIII, the results showed that the *p*-value (two-sided) of review timeliness to online purchase intention was 0.0000, which represented that the relationships were highly significant. The *p*-value (two-sided) of review quantity to online purchase intention was 0.0071 and the *p*-value (two sided) of review valence to online purchase intention was 0.0355, which represented that the relationships were moderately significant.

Based on the results from Table IX, the path coefficients of review timeliness, review quantity, and review valence to online purchase intention were 0.366, 0.2019, and 0.1449, respectively. The results showed that all the independent constructs had positive and significant relationship toward online purchase intention, and the results represented that all of the hypotheses were authenticated and supported by data. In addition, review timeliness is the most influential construct toward online purchase intention compared with review quantity and review valence.

Research finding and conclusion
Overall findings
Based on the Research Final Model (Figure 1), the online purchase intention for electronic products amongst millennials in Malaysia seems to be strongly influenced by review

Construct	Coefficient of determination (R^2)	Adjusted R^2
Online purchase intention	0.3630	0.3539

Table VII. Coefficient determination

Effect	Standard bootstrap results *p*-value (2-sided)
Review timeliness → online purchase intention	0.0000
Review quantity → online purchase intention	0.0071
Review valence → online purchase intention	0.0355

Table VIII. Bootstrap direct effects inference

Independent variables	Dependent variable Online purchase intention
Review timeliness	0.3660
Review quantity	0.2019
Review valence	0.1449

Table IX. Path coefficient

timeliness, review quantity, and review valence. The coefficient of determination (R^2) showed that 36.3 percent variation is explained by the model. The findings of this research align with past studies (Chan and Ngai, 2011; See-To and Ho, 2014; Erkan and Evans, 2016). In this research, review timeliness (0.366***) is the most influential online review element toward Malaysian millennials' online purchase intention of electronic products, followed by review quantity (0.202**) and review valence (0.145*). The findings are supported by researchers such as Chan and Ngai (2011) and See-To and Ho (2014) who demonstrated the importance of e-WOM for companies to propagate marketing messages with a view of influencing consumers' online purchase intention. In addition, Erkan and Evans (2016) mentioned that review quantity plays a critical role in influencing consumers' online purchase intention, which is echoed by the findings of this research.

Finite details from the various indicators of the dependent construct postulated that the most influenced element of the Malaysia millennials' online purchase intention was "Reading Reviews" which accounted 0.829, followed by "Continue Purchasing" (0.801), "Willing to Purchase" (0.774), "Seeing Videos" (0.730), and "First Choice" (0.679) which was the least impactful factor. This represented that millennials in Malaysia are more likely to read and refer to the electronic product reviews before purchasing. However, millennials in Malaysia are more likely to read online text reviews rather than watch videos about the electronic product reviews. This showed that actual reviews are more powerful than graphics in influencing consumers' online purchase intention of electronic products.

In simple terms, online reviews are one of the reliable feedback mechanisms of the millennial's experience prior to using the veracity of the products or services. Reading online reviews help users save time, money, and avoidance of buying underperforming products or services. Besides that, online reviews are commonly direct to the point that depicts the product's insight. Therefore, reading reviews is most influential when compared with other indicator attributes.

Status of findings

H1. The research findings supported Hypothesis 1, "there is a significant correlation between review timeliness and online purchase intention for electronic products among millennials in Malaysia." The result showed that review timeliness was the
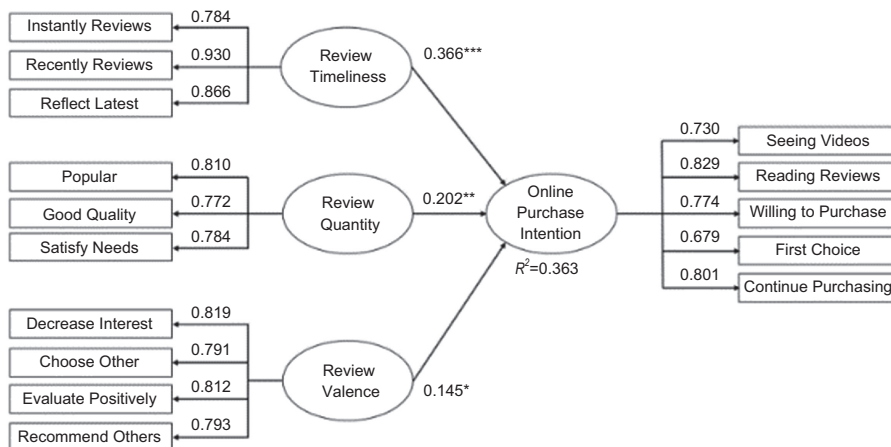

Figure 1.
Final model

most significant construct that influenced Malaysia millennials' online purchase intention of electronic products with the highest path coefficient (0.366). Although previous studies found that there was no significant relationship between review timeliness and consumer purchase intention (Cheung *et al.*, 2008; Zheng, 2008), old online reviews are more helpful than expected (Pan and Zhang, 2011), and Somohardjo (2017) found that review timeliness has a negative insignificant effect on purchase intention of having meals at a restaurant.

Within the review timeliness perspective, a detailed analysis of the results also showed that "Recently Reviews" was the most impactful factor that influenced Malaysia millennials' online purchase intention for electronic products, which accounted for 0.930 as indicator loading. The other review timeliness factors that influenced Malaysian millennials' online purchase intention for electronic products were followed by "Reflect Latest" (0.866) and "Instantly Reviews" (0.784). This represented that the problem identified by level of review timeliness amongst millennials on online purchase electronic products in Malaysia was high and also supported by previous researches (Gretzel and Yoo, 2007; Jindal and Liu, 2008; Pan and Zhang, 2011; Zhao *et al.*, 2015). However, Zhao *et al.* (2015) mentioned that Technology Web 2.0 allowed consumers to access and create products' reviews, which benefited potential consumers to get more provision of up-to-date information, attention, and purchase intention. Hence, recent reviews play an important role in influencing consumers' online purchase intention and increase overall sales for the businesses.

Furthermore, as Malaysia is moving toward the Fourth Industrial Revolution (Industry 4.0), the technology of electronic products is prone to dynamic changes. Therefore, reading the latest online reviews allows users to get the latest and more accurate information for the purchase decision. One of the reasons that "Instantly Reviews" is less influential than "Recently Reviews" is because generally the initial online reviews are created by sellers in order to increase product awareness. Therefore, recent reviews are the most critical factor that influences Malaysian millennials' online purchase intention.

H2. The research findings supported Hypothesis 2, "there is a significant correlation between review quantity and online purchase intention for electronic products among millennials in Malaysia." The result showed that review quantity was one of the significant constructs that influenced Malaysian millennials' online purchase intention toward electronic products with path coefficient (0.202). Previous studies found that there was a significant relationship between review quantity and consumers' online purchase intention, but majority of the studies were focused on beverage industry, tourism industry, and creative industry (Xiaorong *et al.*, 2011; Wensi, 2017; Huyen and Costello, 2017), while no study focused on the electronic products industry. Therefore, this research found that Malaysian millennials today also focus on review quantity in order to get more reliable reviews and feedback before purchasing electronic products via the Internet.

Within the review quantity perspective, a detailed analysis of the results also showed that "Popular" was the most impactful factor that influenced Malaysian millennials' online purchase intention for electronic products, which accounted 0.810. The other review quantity factors that influenced Malaysian millennials' online purchase intention for electronic products were followed by "Satisfy Needs" (0.784) and "Good Quality" (0.772). These findings concur with findings from past researchers (Xiaorong *et al.*, 2011; Cheung and Thadani, 2012; Tsao *et al.*, 2015; Aljahdali, 2016; Huyen and Costello, 2017).

This construct is connected to review timeliness, when every consumer provides reviews after purchasing, and then the quantity of online reviews will be increased and updated frequently. The more quantity of online reviews, the lesser the hidden information, the deeper

the discussion, and information is shared for producing a better analysis. Apart from this, if the product is trendy, Malaysian millennials are more likely to discuss or share information with others, immaterial of the status of the feedback. This finding also postulates that the quality of the product is not the first criteria that Malaysian millennials focus on. Malaysian millennials experience the phenomenon of crowd mentality, and as such will think that the electronic product is popular, which ultimately leads to higher online purchase intentions. Therefore, Malaysian millennials' online purchase intention is affected by review quantity in evaluating the popularity of the electronic products.

H3. Furthermore, this research finding supports Hypothesis 3, "there is a significant correlation between review valence and online purchase intention for electronic products among millennials in Malaysia." The result showed that review valence was the least significant construct that influenced Malaysian millennials' online purchase intention of electronic products with the path coefficient (0.145). Although numerous studies (Liu, 2006; Duan *et al.*, 2008; Cheung *et al.*, 2009) found that there was no significant relationship between review valence and consumer online purchase intention, majority of researchers found that the results were aligned with the findings of this research. However, different researchers found different results, such as Ketelaar *et al.* (2015) found negative reviews are more influential than positive reviews in the consumers' purchase intention, and East *et al.* (2008) found positive reviews are more influential than negative reviews in the consumers' purchase intention.

Within the review valence perspective, a detailed analysis of the results also showed that "Decrease Interest" was the most impactful factor that influenced Malaysian millennials' online purchase intention for electronic products, which accounted 0.819. The other review valence factors were followed by "Evaluate Positively" (0.812), "Recommend Others" (0.793), and "Choose Other" (0.791). The findings from this research solidifies that the level of review valence among millennials of online purchase electronic products in Malaysia is further supported by previous researchers (Cheung and Thadani, 2012; Lopez and Sicilia, 2014; Purnawirawan *et al.*, 2015; Sutanto and Aprianingsih, 2016). Moreover, these results showed that negative reviews are more influential than positive reviews, and this was supported by East *et al.* (2008) and Sutanto and Aprianingsih (2016). The research findings also seem to be contrary to previous studies (Lee and Koo, 2012; Wu, 2013), where Malaysian millennials are more convinced by negative reviews than positive reviews.

Negative reviews are the most compelling feedback from the consumers which directly spell out critical weaknesses of the product or service. As Malaysian millennials are more likely to read text reviews and be influenced by large numbers of negative reviews, online retailers should ensure there are no extremely bad online reviews or keywords written by users or consumers. If online retailers respond to negative comments politely and tactfully, this will give a chance for retailers to salvage them from the adverse impact of their online sales, and maintain cordial relationship with potential customers.

Implications of this study
As mentioned above, review timeliness was the most significant element of online reviews that influenced millennials' online purchase intention for electronic products, followed by review quantity and review valence. This showed that the research findings demonstrated the latest Internet environment trends for online businesses, especially for electronic product businesses which may be contrary to previous studies (Zhao *et al.*, 2015; Sa'ait *et al.*, 2016; BrightLocal, 2017). In order to convince more consumers and maximize the business revenues, the online retailers must focus more on the fast response rate rather than on identifying solutions for shaping the review valence about the electronic products.

As technology evolves, and as Malaysian millennials overwhelmingly patronize the phenomenon of crowd mentality, there should be avenues for immediate response on pressing issues on negative online reviews. Hence, this would enhance the credibility of the online electronic product vendors and assist them with an increase in brand loyalty, and overall customer satisfaction for future purchases.

Besides that, when the response rate is high, the number of online reviews naturally will be increased due to online consumers being more willing to share experience about the electronic products as well as get approval or instant solutions from online sellers. This can directly help the business to attract more online users to purchase electronic products and generate more revenue at large. Therefore, business owners and online retailers must appoint a dedicated individual to be responsible in the business for all online reviews, to clear up any confusion amongst online consumers. Although those negative reviews will affect the purchase intention of Malaysian millennials, but by responding to the negative reviews in a very polite and tactful manner, it will increase the trust of online consumers.

Another way to increase the quantity of online reviews is by encouraging online consumers to write more online reviews after purchasing and sharing their experience of purchasing the electronic products. There should be incentives given to online consumers to write online reviews. For example, online consumers should be rewarded with a 10 percent discount voucher (for future online purchases) after having written an online review for the specific electronic product purchased (Somohardjo, 2017).

In addition, the research findings found that positive reviews are more strongly influential than negative reviews, and therefore, H.E.A.R.D. technique (Markidan, 2015) may be used by online retailers to shape the online reviews easily. H.E.A.R.D. technique is one of the methods that allow maximizing consumers' satisfaction and increasing the response rate and quantity of online reviews. The right way to implement H.E.A.R.D. technique for electronic products is appended in the table below (Table X).

Contribution to theory

One of the major contributions of this research is by providing a totally new dimension by converging review timeliness, review quantity, and review valence in relation to its impact on online purchase intention. This study further provides clarification and incremental knowledge in context to other researchers (Lee and Lee, 2015 as cited in Aliyar and Mutambala, 2015; Jindal and Liu, 2008 as cited in Zhao et al., 2015) in the area of predictors of online purchase intention.

In addition, according to Wensi (2017) and Matute et al. (2016), both studies were using snowball sampling (known as convenience sampling), with some certain groups more likely to be sampled than other groups. This caused the potential respondents to not have an equal

Element	Descriptions
Hear:	Often consumers just want a person who listens so, and let the consumer talk without disturbing
Empathize:	Give the consumer the feeling that you understand the consumer's situation. Phrases like "I would be mad too" can help
Apologize:	For a real upset consumer, apologies are never enough. Even if you aren't responsible for what made the consumer upset, apologies are never enough to compensate the consumers feeling. Phrases in the "I" sentence like "I am always sorry" can help
Resolve:	Key is to solve the problem quick. It is okay to ask the consumer: "What can I do to solve this problem?""
Diagnose:	After the conversation with the consumer, the next step is to find out how this mistake happened. Important is to blame no one. Key is to focus on fixing the process to prevent the same problem in the future

Table X.
HEARD technique

chance to participate in the same research. Therefore, this research used simple random sampling methodology to ensure all the potential respondents have the equal chance to participate in the research.

Finally, the incorporation of the H.E.A.R.D. technique (Markidan, 2015) as one of the solutions from the findings of this research is an illustration of blending and infusing previous theories with concepts of revolutionary dimensions for the future.

Limitations
One of the limitations of this research was that the research findings may only be suitable and applicable for future researchers to use as reference or guideline to the related topic only in Malaysia. This is because this research was only conducted in Federal Territory of Kuala Lumpur, which is unable to represent the whole Malaysia. The target respondents were only the millennials in Malaysia, which do not represent the whole Malaysian population.

In addition, this research only focused on few elements of online reviews such as review timeliness, review quantity, and review valence, which are unable to analyze well the most influential online review element that influences Malaysia millennials' online purchase intention for electronic products. Furthermore, the sample size of this research was small and is unable to get the highly accurate results compared with large sample size research. Finally, this research was using simple random sampling methodology, which is low accuracy compared with stratified sampling or systematic sampling.

Recommendations for future research
As mentioned above, the research findings were only focused on millennials in Malaysia and the targeted area was Federal Territory of Kuala Lumpur. In order to get more details and completeness research about Malaysians' online purchase intention for electronic products, future researchers may conduct further investigation in Johore, Perak, Pahang, Kedah, Kelantan, Malacca, and other states in Malaysia. Besides that, future research may conduct further investigation in other countries or do some comparison between countries. Moreover, the scope of respondents also can be extended to different generations or occupations such as baby boomers, generation X, farmers, functionary, freelancers, and so on. In addition, future research may also include review relevance, review accuracy, review comprehensive, and others to make the study more attractive and completive. Furthermore, as mentioned above, the larger sample size is always better due to the accuracy of the results; therefore, future research may increase the sample size.

Conclusion
The purpose of this research was to examine the type of online reviews (review timeliness, review quantity, and review valence) and its relationship toward online purchase intention for electronic products amongst millennials in Malaysia. Numerous studies were analyzed in literature review, whereby majority of the studies have shown a positive relationship between online purchase intention and the type of the online reviews, but some of the studies had different outcomes. This research was conducted in Malaysia amongst the millennials in Federal Territory of Kuala Lumpur.

The research results prove that review timeliness, review quantity, and review valence have a positive and significant correlation with the online purchase intention for electronic products. After examining these three elements of online reviews through PLS-SEM, review timeliness has dominated the most in influencing Malaysian millennials' online purchase intention for electronic products, followed by review quantity and review valence.

Within the review timeliness perspective, reviews were the most impactful factor that influenced Malaysia millennials' online purchase intention for electronic products. This showed that online consumers today are more likely to use and be influenced by up-to-date

information toward the online purchase intention and purchase decision. While within the review quantity perspective, online consumers felt that large number of online reviews for electronic products represented a higher level of popularity. Therefore, large number of online reviews can directly influence Malaysia millennials' online purchase intention for electronic products. In addition, within the review valence perspective, negative reviews had stronger influence than positive reviews, which resulted in Malaysian millennials being influenced and convinced by negative reviews.

In the final analysis, it can be seen how both the antecedents and dependent constructs in the study have been infused like a pair of "Chopsticks" in crystallizing review timeliness and reviews as the empirically tested key elements of online purchase intentions for electronic products amongst the Malaysian millennials.

Hence, this research project has provided the researcher and marketers more clarity into the area of online purchase intention for electronic products, which is a volatile and dynamic area with continuous uncertainty.

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