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Global Journal of Business Information System

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The Adoption of System Theory by Markus (1983) On User Resistance Determinants of ERP System in Malaysia

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ABSTRACT

In nowadays, the use of technology for managing the information becomes crucial for most of the businesses. The phenomenon is complemented with the urge by the government for all enterprises to go digital in their day-to-day business processes. This has resulted in the increasing demand for information technology (IT) adoption, specifically the Enterprise Resource Planning (ERP) System. Consequently, the adoption has also led the increasing debate in relation to the issue of the system usage among the end-users, which is user resistance. The purpose of this paper is to provide the idea for revalidation of the factors for Malaysia employees to avoid from active use of ERP System by applying the System Theory.

Keywords: ERP; adoption; System Theory; resistance; Malaysia

INTRODUCTION

Kumar and Hillegersberg (2000, pp. 22) have defined ERP system as "A configurable information system packages that integrate information and information-based processes within an across functional areas in an organization". The implementation and adoption of the ERP system is to allow the enterprises to secure their competitiveness. Although the use of ERP system can be said as mandatory since employees unable to perform their job without the use of the system (Li, Liu, & Liu, 2016), however there are still many difficulties to ensure employees utilize the ERP system effectively. The difficulties are rooted from the phenomenon of acceptance or resistance of usage by the employees. It is proven from the statement made by Kumar (2013) that the ERP system usage in Malaysia is in dismissal state. Moreover, Enterprise IT News (2014) reported that, 63% of companies globally, that include Malaysia, are facing failure with ERP system usage. In the view of Malaysia economic environment, companies with MSC status are the prominent industry, notable in the business of technology or digital (New Strait Times, 2018). Therefore, does resistance also exists in MSC companies? How many percentage of MSC companies resist to actively use ERP system? Does the factors of resistance in MSC companies is due to the system factor? Therefore, this paper aims at drawing a map for future research in revalidating the determinants for end-users to resist from using the ERP system actively by applying the System Theory. This paper may help future research to identify the size of resistance towards ERP system in MSC companies.

LITERATURE REVIEW

Enterprise Resource Planning (ERP) System

Many studies have found higher rate of ERP system implementation failure due to many challenges face by the firms. Among the challenges include inefficient technology planning; insufficient user involvement and training; limited budgeting and scheduling; and absence of adequate skills (Beheshti, Blaylock, Henderson, & Lollar, 2014). However, according to the prediction of Sreedhar (2011), the ERP system implementation will grow at 21% until 2015 (Beheshti et al., 2014). In addition, the market eventually started to focus on adoption of ERP cloud solution (Tekshapers, 2018). Therefore, with the

never-ending change in the landscape of ERP system, it is important for the enterprises to learn from mistakes by adapting and staying relevant with the condition in relation to operation and risk management (Morgan, 2019).

Development of ERP System in Malaysia

The introduction of ERP system globally including Malaysia, starts from 1960s, that is called Inventory Control Packages (Supramaniam & Kuppusamy, 2010). The technology was later known as Manufacturing Resource Planning (MRP) system (Radley, 2018). The MRP developed into MRPII and continue to evolved into MRPIII (WorkWise, 2018) in 1970s. Throughout the years, many leading ERP system software were founded such as SAP software, Lawson software and Baan Software. In the 1980s, the IBM System/38 and PeopleSoft's Human Resource Management System (HRMS) were introduced (Grant, 2000). In 1990s to 2000, all core business enterprises that include government and non-profit organization started to buy and installed the ERP system (WorkWise, 2018). In the year 2005 until today, the ERP system has become a great reliance for many areas in small and large enterprises (Noudoostbeni et al., 2009).

User Resistance

Klaus and Blanton (2010, pp. 627), have defined resistance due to a system as "A behavioral expression of a user's opposition to a system implemented during the implementation". Klaus and Blanton (2010) also posit that the emergence and the development of resistance behavior may take place during and after the implementation of the system. Due to this, user resistance becomes a severe plague to widespread among the adopters. Salih, Hussin, and Dahlan (2013) have found the factors of user resistance to be due to resistance of users towards change, changes in job responsibility, expectations, needed efforts increased, lack of training, lack of education, issues in the usability of the system, and resistance towards the use of technology generally, lack of involvement and lack of communication between the management of adopters and the users. Other factors include age, culture and bad experience (Hani & Mahadi, 2014). Therefore, it is proven that resistance among users is a well-echoed phenomenon in the literature of IT implementation or adoption (Ngafeeson, 2015).

System Theory

As supported by Markus (1983), to comprehend the possible origins for the users of IT to develop resistive behavior, it is necessary to identify and discuss on the reasons for resistance at the first place (Indalecio & Joia, 2018). Hence, this paper suggested for the application of System Theory proposed by Markus (1983) because; 1) the theory focuses on the reasons of resistance in the view of the system, which could become a simple red flags to be removed; 2) the theory has theorizing resistance based on the perspectives of individual when the they are connected to the system personally; and 3) the theory would be able to be a roadmap for ERP system adopters to understand simple and reasonable ways to overcome resistance. However, with the absent of specific tested names for factors of resistance in the theory, it allows for free selection of appropriate dimensions.

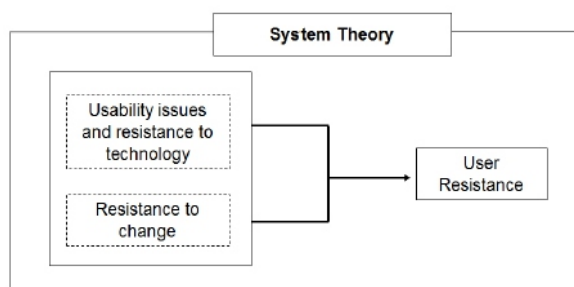


Fig 1 Conceptual Framework. Source: Markus (1983).

SYSTEM FACTOR

Markus (1983) explained that resistance may emerge because of the technology-formed of factors. The factors include user interface available, performance from the usage, level of centralization, ease of use (Jiang, Muhanna, & Klein, 2000), usability issues and resistance to technology (Salih et al., 2013), quality of generated information (Bailey & Pearson, 1983) and system support (Ives, Olson, & Baroudi, 1983; Sanders & Courtney, 1985). In short, system factor illustrate the flaws of the system. The condition may have significant negative effect on the users. Therefore, it is suggested that the element of 'usability issues and resistance to technology' is tested. It is because the other elements (such as; user interface, usage performance, level of centralization, information quality and system support) can be collectively categorized as usability issues. Besides, an additional element of 'resistance for change' can also be tested as one of the system factor. Although Haddara and Moen (2017) denoted that system factor would be appropriately explain forces that available externally, according to Ainsworth (1977), the element may be also be classified under the factor of system. Therefore, the additional element, which was mostly tested under people factor, can be another element to fill the gap.

RESEARCH METHODOLOGY

This conceptual paper is conducted through literature reviewing on the topic of resistance in relation to ERP system. For future research, this paper is suitable to apply a sampling technique of simple random in selecting sample firms, which allow every sample to have equal chances of being selected. Since this paper is based on the perspective of the users, the unit of analysis should be the individual, where one employee in the MSC status companies will be the representative in providing responses in self-administered online questionnaires. One of the possible medium to obtain the listing is from the Malaysia Digital Economic Corporation (MDEC) Directory. It should also be noted that the employees should have the criteria of; 1) having authority to make management decision; 2) having ERP system literacy; and 3) frequent users of the system. The variables can be measured using 5-point Likert scale with 1=Strongly Disagree (SD), 2=Disagree (D), 3=Neutral (N), 4=Agree (A) and 5=Strongly Agree (SA). The analysis of data may involve the use of SPSS as a statistical tool.

CONCLUSION

This paper would be able to assist future research to identify the readiness of Malaysia companies, notable the companies with MSC status, in achieving government's aspiration towards digitizing enterprise business processes through the adoption of ERP system. Moreover, this paper may also become a roadmap to the future research in developing the framework of System Theory to be applied in analyzing the prominent issues of ERP system to arise nowadays. Therefore, the results obtained based on the System Theory can be used as a roadmap, specifically for MSC companies, to take productive corrections.

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Environmental Concern and Government Regulations Roles in Influencing Ecologically Conscious Consumer Behaviour

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ABSTRACT

Environmental concerns have increased dramatically in recent decades. Individuals have become more concerned with their purchasing behaviour and the impact on the environment. As a result, marketers tend to be more committed in responding to the needs and desires of these individuals in a more responsible manner, considering possible environmental damages that may occur. This study pursued to establish the relationship between young consumers and ecologically conscious consumer behaviour (ECCB) by analysing their green environmental concerns (EC) and government regulations (GR) variables. The scope of the study was UiTM's students ages between 18 to 30 years old pursuing their undergraduate studies. The Statistical Package for the Social Sciences (SPSS) version 23 is applied to study the hypotheses. The results from the linear multiple regression analysis indicated that both EC and GR had a positive relationship on ECCB. Moreover, the overall results have confirmed that the government regulations have a strong direct influence on ecologically conscious consumer behaviour. Thus, the findings could offer important young consumers' perceptions and views on environmental sustainability.

Keywords: *Environmental Concern, Ecologically Conscious Consumer Behaviour, Government Regulations, Sustainability, Young Consumers*

INTRODUCTION

At present, the environmental problems have become world problems that include problems such as global warming and climate change. Consequently, there has been a drastic change in quality and quantity in all life, not only human life, but also the economic and social conditions of people (Maichum, Parichatnon, & Peng, 2016). Many countries in the world have adopted a sustainable green life concept to mitigate the adverse side effects of development and modernization that has directly caused pollution and deterioration of the natural resources.

Areas in Asian countries have also adopted the 'go-green' power as to curb the ecological threat that interferes with local governments and the people (Lee, 2008). According to Desan (2009), the Malaysian Green Technology Policy (2009), which is also known as 'Green Malaysia' has outlined five strategic areas: - (i) firming up the frameworks of the authority body, (ii) offering an encouraging environment for green technology development, (iii) increasing work force development in green technology, (iv) increasing green technology research and innovations, and (v) handling promotions to enhance society alertness. All these refer to activities that are not polluting the environment, can be recycled, reducing the consumption of natural properties and eradicating the usage of toxic substance and contamination. Therefore, these could be an important starting point to bring the society to be ecologically conscious consumer behaviour and contribute to sustainable development.

Generally, consumers are aware that their behaviour towards purchasing has side effects on global warming, climate change and ecological-related problems. This also causes users to become more aware of sustainable consumption, and their impact on the environment (Prakash & Pathak, 2017).

Commonly, people can be divided into two groups when it comes to environmental issues; the one that puts the responsibility on the government and the second group are those that are highly concerned about environmental sustainability and they themselves put the effort to curb the problem.

Environmental issues are the responsibility of all. This is because environmental issues are caused by humans as well (Oskamp & Saunders, 2003; Ramly, Hashim, Yahya & Mohamed, 2012). Thus, the society, behavioural resolutions and legislative acts are needed to change these reckless attitudes and behaviours as they are the drivers of sustainable consumption in the future.

The young people are the future generation of the nation. They have different perceptions and behaviours as compared to other age groups (Kanchanapibul, Lacka, Wang & Chan, 2014). They not only consider the present but, also care about the future consequences of their actions and may choose to become green consumer products throughout their lives if being exposed at an early age. At the same time, younger users are more inclined to technology or social media. This allows them to find information online for any purposes. Guided by this information, Kanchanapibul et al., (2014) contended that comprehending the views of young people on green behaviour is very vital as they are the future users and community representatives.

In Malaysia, youths aged between 15 and 30 years make up nearly 30 per cent of the population (DOSM, 2017). As agents of change, they also play a role in shaping the present-day lifestyle of the next generation (Castillo, 2016). As a founding future of policy and practice, they will incorporate sustainable development in the education and learning process. Given the opportunity to be exposed to formal education, they have lived their entire lives in an era where environmental issues have appeared before their eyes. The youth lack of sustainable environmental awareness and concern need to be corrected. The needs to understand and identify the youth awareness, concern, as well as their aspirations for sustainable development are very vital as to ensure the Malaysian Sustainable Development is achievable.

Youth can lead the way to sustainable consumption. Firstly, explain to them the main attributes of the current society, social and ecological behaviours that will impact the world of consumerism. Secondly, the opportunity and the potential for sustainable consumption in providing substitutes to the conventional lifestyles. Finally, the mammoth prospect for youth to develop skills in pressuring authorities towards unhealthy consumption and to creating different methods of living in the world (Fien, Mathew & Bentley, 2008). Youth as the key stakeholders with a unique contribution to make towards sustainable development is very essential (<http://www.way.org.my/mpac-2015-2019>).

Furthermore, the issue of the environment has attracted the attention of Malaysian legislators and the people over the last two decades (Haron, Paim & Yahaya, 2005). Ahmad and Judhi (2008) strongly supported the government's diligent determinations and policies in generating an environment for Malaysia's sustainable consumption and development. Among the policies that have been implemented include education on the environment in schools and creating environmental concerns among the society over ecological issues in ensuring the sustainable consumption practices (Mat Said, Ahmadun, Paim & Masud, 2003; Tan & Lau, 2010; Ahmad & Judhi, 2008; Haron et al., 2005; Kianpour, Anvari, Jusoh & Othman, 2014). Indeed, the gap between environmental concern about ecological biodiversity and the government's role in implementing policy and regulations needs to be bridged as to cultivate sustainable consumption among Malaysians, particularly the youth.

LITERATURE REVIEW

Sustainable Consumption

The purpose of sustainable consumption is to minimize the environmental, social and economic negative impacts encountered. Consumption activates include population growth, economic activity, technology choices, social values, institutions and policies. Thus, consumers must adopt environmentally responsible consumption behaviours and lifestyles in concordance with sustainable consumption concepts.

Sedlacko, Martinuzzi, Røpke, Videira, Antunes & Pisano, (2012) found that sustainable consumption strategy is crucial for economic development in meeting the needs of the people and at the same time protecting the environment. It is a strategy that uses new techniques that can manage demand for economic, environmental and social. Therefore, there are urgent changes required in human behaviour and cultural practices to minimize the effects of overconsumption. Basically, the concept of sustainable consumption is about a person's attitude in deciding, possessing and discarding of goods and services in an environmentally friendly way that will advantage the society and the environment. Changes in unsustainable consumption patterns require emphasise in use of resource optimisation and minimisation of waste in industries, households and individuals.

Principally, government needs to monitor activities in the industrialized areas, those are enormously dangerous to the environment and identifies inept and improvident in the industrial development processes. This means that the main task of the government is to avoid any unsustainable patterns. Furthermore, efficiency in production is pivotal in achieving environmental quality and sustainable development.

Undoubtedly, to achieve a sustainable lifestyle, especially policy makers need to understand the relationship between the purchase behaviours and elements of individual habits. Everyone has his own particular qualities of behaviour and attitude that connect in different ways in sustainability. The sustainable behaviour can be achieved if behaviour change tools are practiced and that include commitment and dedication. Generally, people are aware of what is happening to the environment and ecology. Yet, they admit that their knowledge of their choice of consumption and its ramifications for the environment is insufficient (Khare, 2015).

Environmental Concern (EC)

As to date, everyone is talking about environmental concern. Concern towards the environment and society has increased rapidly, and it involves everyone in the society. The public needs to be informed that they are the problem of the environmental disaster. Indirectly, this will make individuals become more aware that their individual behaviour has a direct impact on the environment and on future generations of life. The growing concern about environmental issues is also reflected by the increasing demand for environmentally-friendly products and the pressure on companies to conduct their business socially and ecologically.

Yeung (2005) purported that environmental concern as an imperative trait that illustrates an individual's empathy, likes, and hatreds, and anxiety about the surrounding and it arrays from very unconcerned to extremely concerned (Dagher, Itani & Kassar, 2015). Environmental concern factor able to impact on individuals' motivation to act in a way that can lessen environmental problems (Seguin, Pelletier & Hunsley, 1998). The higher the level of the environmental concern will enhance the level of green

behaviour. Accordingly, environmental concern is positively related to behaviours favouring the preservation of natural resources and furthermore, for people with greater environmental concerns attitude has a greater effect on intention (Kranz & Picot, 2011).

Due to the relationship that exists between ECs and the demand of the consumer for environmentally friendly products, a new concept of marketing has emerged and known as green marketing. Past studies have identified how environmental concern influenced green behaviour such as Hanson (2013), signified environmental concern has a positive association with the attitude towards green consumers in Canada. Similarly, in India and Thailand, the environmental concern also significantly stimulates the youth consumer attitude towards green products (Yadav & Pathak, 2016; Maichum et al., 2016). Apaydin and Szczepaniak (2017) indicated that young Polish aged 18 to 35 years, despite their high environmental awareness of green issues, they are not concerned about protecting the environment. Paying more for eco-friendly products and services were not their concern. The young Polish perceived that economic development is much more important than protecting the environment. They also assume a person's behaviour is not enough to contribute to environmental improvement. Therefore, they do not show interest to engage in environmental activities and do not support the environmental movement and they show a moderate level of green habits. Mainly the respondents in this group were male with a high level of environmental knowledge.

Government Regulations

Bélgica and María José (2016) designated that citizens who are concerned about the environment, are certain that environmental protection is the government's role. Therefore, in protecting the environment, the government must play an important responsibility. Although, for decades, the government has played a role in upholding social interests through laws and regulations (Wood, 1991), protecting the environment and edifying sustainable consumption by employing strategies and guidelines (Tan & Lau, 2010; Myers, 1997), but still insufficient, because Banerjee (1998) emphasized that more different rules and various environmental strategies are required to raise environmental concerns to ensure behavioural change among the public.

In fact, governmental officials must try to persuade people to consume correctly, use regulation and improve society consideration to foster consumer consciousness and concern regarding the environment (Ghazali, Abdul-Rashid, Aoyama, Tontowi & Sakundarini, 2017). At the same time, the legislation also puts pressure on businesses to be more environmentally friendly (Barakat & Cairns, 2002) and this suggests that the government's legislative policy is crucial as a catalyst in promoting higher environmental responsibility among the people (Dummett, 2006). In order to create ecologically conscious behaviour, the government should consider enforcing intense prisons for polluters either to organizations or the public. For organizations, including pricing strategies to prevent the use of heavy sludge, mandatory environmental feasibility studies for projects and polluting the cost of cleaning.

Almost a decade ago, Young et al., (2010) have identified that there has been a growing interest in informing consumers about the environmental aspects to consider when buying products. In order to support these tasks, government should make a concerted effort to examine the relationship between production and consumption, environment and demographic factors which initially will assist government in developing new concepts of sustainable growth and prosperity. Eventually, these new concepts of wealth and prosperity would lead to higher standards of living through changed lifestyles that are less dependent on the limited resources of the earth.

Being the main authority in the nation, government needs to stringent the law and regulation regarding the environment. Yes, fundamentally Malaysian government all well occupied by law and regulation regarding environmental. However, all these laws and regulations required forceful enforcement. Sharom (2008) uttered that if law and environmental enforcement is improved in this country, then the nation could be said working towards that goal. However, the word sustainability development was just being applied as a trendy term but never really acted on it. The government must take decisive action and enforcement to achieve the country's sustainable development program. Impose severe penalties for those that violate this law. In fact, the call for the forward movement is not the government alone, it is also in the public. He also agreed that penalties in environmental law should be reviewed and revised.

Ecologically Conscious Consumer Behaviour (ECCB)

Stern (2000) defined ecological conscious consumer behaviour as a behaviour with the intention to change or benefit the environment. Consumers exhibit their environmental concerns through purchasing patterns by buying eco-friendly products progressively (Paco & Raposo, 2009). While several of the citizens label themselves as environmentally aware, yet, in fact, their actions do not show much ecology (Tamuliene, Kazlauskiene, & Pileliene, 2016). Ecologically conscious behaviour is an individual effort that will limit their activities, which may cause negative (harmful) effects to the environment. The behaviour of individuals who are ecologically conscious may be influenced by the level of ecological knowledge, which is owned by individuals (da Silva Tamashiro, da Silveira, Merlo & Ghisi 2013). Nevertheless, environmentally conscious consumers are a very important target market segment for whom environmental considerations are important purchasing drives (GMA and Deloitte, 2009). The need to understand the level of environmental awareness among consumers will be an effective refresher criterion for market segments (Paco & Raposo, 2009).

According to Krajhanzy (2010), the ECCB component is a pro-environmental purchasing behaviour, pro-environmental post purchase behaviour (e.g. recycling) and pro-environmental activities. Pro-environmental behaviour is a behaviour that is generally judged in the context of a society that is considered as a mean of protecting the environment or respecting a healthy environment. Consumers that are aware of the environmental concern understand how product development, creation, delivery, use and disposal processes result in heavy environmental impact and lead to additional spending (Omar, Osman, Alam & Sanusi, 2015).

Basically, ecological awareness concentrates on a certain element of consumer behaviour that known as consumer purchase intentions and their readiness to pay higher prices for biological merchandises (Laroche, Bergeron & Barbaro-Forleo, 2001). Environmental behaviour can be caused by aspects such as the wish to save money (shown by the reduction of energy and water use), and other psychological elements (when consumers feel it is the right way to act). It has two categories of ecological users: (1) those who are confined to receiving ecological behaviour (e.g. price increases determine the decline in consumption), and (2) those who are ready to pay more for ecological products (Laroche et al., 2001).

Relationship between Environmental Concern and Ecologically Conscious Consumer Behaviour

Concerns about the environment have developed in the past. In the twenty-first century, businessmen and politicians have been using environmental issues as a source of competitive advantage as to gain community concerns. In fact, the link amongst attitude and behaviour has been investigated in various aspects. In general, the link was confirmed to indicate as having a positive direction (Roberts and Bacon, 1997). Furthermore, ecological and environmental concerns are often used as proxies for social responsibility. Therefore, it is pertinent to show a strong association between ecologically conscious consumers and environmental behaviour (Roberts, 1996).

Bamberg (2013) estimated that the level of environmental concern consumers has a direct and significant impact on how they behave about recycling and energy-saving, purchasing environmentally friendly or travelling method choice (Bamberg, 2003). Furthermore, the more highly concerned people with environmental issues, the more they will buy environmentally friendly products compared to those that are less concerned (Kim & Choi, 2005). Fundamentally, one's level of environmental concern should be linked to the possibility of performing multiple ECCBs. Bronfman, Cisternas, López-Vázquez, de la Maza and Oyanedel (2015) highlighted environmental concerns for having a strong attitude to protect the environment. Roberts (1996) suggested that individuals with higher environmental concerns are more likely to engage in ECCB that directly explains the readiness of users to act in an ecologically positive way. Thus, this signified environmental concerns is an important predictor of ECCB (Roberts, 1991, Ramly et al., 2012). The concept of environmental concern and the ECCB is closely interrelated, and if one whom is more concerned about the environment, these concerns could lead to more ECCB (Dagher, Itani & Kassar, 2015; Antil, 1984). Following the above-described environmental concern and the relationship with ecologically conscious consumer behaviour, this study hypothesized that:

H1: There is a positive relationship between EC and ECCB

Relationship between Government Regulations and Ecologically Conscious Consumer Behaviour

Reducing consumption is the best and most effective method to condense carbon emissions and tackle climate change issues. Regrettably, the human consumption of natural resources is increasing. Recent research shows that the world needs the equivalent of 2.6 earths to support the consumption demand by 2050 (Gorrie, 2018). While there is an urgent need for the international community and countries to address the consumption of the individual to avoid dangerous and potentially catastrophic climate change, traditionally there is a reluctance to use the law to do so (Gorrie, 2018). Previous studies have shown that there are at least three approaches to promote responsible consumption. First, public policy forms one type of governance where the regulation forms the behaviour of the public through incentives or penalties (e.g. Albareda, Lozano & Ysa, 2007). Second, non-governmental organizations (NGOs) offer free advice, information and advocacy aimed at influencing government policies, firm practices and consumer behaviour (e.g. Konga, Salzmännb, Stegerb & Ionescu-Somersb, 2002). Finally, corporation's backup business choices that produce business returns that can be measured with the credence what benefit the business is excellent for the society, perhaps indirectly (e.g. Russo and Fouts 1997).

Maloney (2015) recently explored this topic, stating that the role played by law at present is minimum in regulating the consumption of which is directly related to the ECCB. Maloney firmly advocated that the implications of environmental (and social) implications are very important so that the legal system plays a role in setting guidelines and rules for sustainable consumption. Indeed, Connell (2011) agreed that legislative strategies are key indicators of environmental attitude and similarly Qader & Zainuddin, (2011) also concluded that environmental legislation affects consumer environmental attitudes. Furthermore, researches have testified that the government role in environmental protection certainly influences consumer attitude of the consumers toward ecological merchandizes (Norazah, 2016). Recently Chen, Chen & Tung (2018) discovered that environmental awareness/concern and role of the government vitally and absolutely influenced environmental for sustainable consumption. Having the backdrop discussion, the study hypothesizes that:

H2: There is a positive relationship between GR and ECCB

UNDERPINNING THEORY

Motivation–Ability–Opportunity (MAO) framework by Olander and Thøgersen (1995) was used in this study as the underpinning theory in understanding consumer behaviour. MAO model has two paradigms - ability and opportunity, as the essential pre-conditions to green consumer behaviour. The ability paradigm combines both habit and task knowledge, while the opportunity paradigm integrates facilitating or 'opportunity' situation to carry out the behaviour. The framework indicated that the positive attitude of the consumers will motivate them to the wanted behaviour given that they possess the ability and opportunity to act on that wanted behaviour. Additionally, this study also applied Phipps et al. (2013) the theory of reciprocity deterministic in understanding the sustainability consumer behaviour. They emphasized the important roles of past behaviour as a future barometer of sustainable behaviour. This framework showed that individual elements for example attitudes, together with sustained behaviour and past socio-cultural environment, will affect the upcoming sustainable behaviour. So, it can be concluded from the above argument that consumer behaviour is not only stimulated by attitude, but also through many individual factors and circumstances. In this study, the circumstantial factors are the government regulations. Furthermore, these elements would reinforce or decline the strength of attitude-behaviour association.

RESEARCH METHODOLOGY

Data Collection and Measurement Scales

This study was conducted online using a quantitative approach of a self-reported survey questionnaires that were published on the website. An invitation with an attachment of the hyperlink to the questionnaire website was sent to the UiTM Melaka students using the convenience sampling method. 18 items were adapted from established instruments and were operationalized using 7-point Likert scales, measuring from 1=strongly disagree to 7=strongly agree. The Statistical Package for the Social Sciences (SPSS) version 23 was used to identify the reliability testing of the scales and answer the hypotheses by using the multiple regressions. Overall, 211 responses were obtained. The questionnaire comprises of three (3) sections that are clarified below.

Environmental Concern

The first section of the questionnaire refers to questions about environmental concerns containing eight (8) questions from Roberts and Bacon (1997) where researcher examined the level of respondents' concerns that they have towards ecological conscious consumer behavior. The questionnaire was designed to identify whether the respondents were concerned about the environmental issues that had taken place around them as well as what was happening in the world today.

Government Regulations

The second section of the survey instrument is to evaluate the views of the public as Malaysian citizens while dealing with the government on regulations related to environmental issues. There are five (5) questions adapted from Greendex (2010) that measured by the environmental impact of the respondent's consumption patterns. In this study the respondents were asked to evaluate the regulations implemented by the Malaysian government in curbing environmental problems.

Ecologically Conscious Consumer Behaviour

The third section of the questionnaire consists of five (5) questions also adapted from Roberts and Bacon (1997) with the primary intention to determine the level of practice that the public has for ecological conscious consumer behavior. Questions were to identify how the respondents behave as the citizens on consumption attitude.

ANALYSIS OF RESULTS

Respondent Characteristics

Table 1 showed the demographic profile of the respondents by gender, age, education, status and residing. Most of the respondents were female with 154 as compared to male with only 57. Most respondents (54 %) were from the age group between 21-30 years old. They are about equivalent of tertiary education backgrounds with 104 with a diploma and 107 with a degree. From Table 1, 141 respondents were from urban area and 70 were from rural area.

Table 1 Respondents' Profile

Demographic variable	Item	Frequency	Percentile
Gender	Male	57	27.0
	Female	154	73.0
Age	18 - 20	96	45.5
	21 - 30 years old	115	54.5
Highest educational level	Diploma	104	49.3
	Degree	107	50.7
Occupation	Student	211	100.0
Status	Single	211	100.0
State Currently Residing	Urban	141	66.8
	Rural	70	33.2

Factor Analysis

For this study, factor analysis (FA), under the extraction method of principal component analysis with the rotation method of varimax with Kaiser Normalization, was used to analyse the scales. Varimax rotation was used, as it minimized the correlation across factors and maximized within the factors (Nunnally 1978). Furthermore, items loadings with more than 0.50 on one factor are taken for next analysis (Nunnally, 1978). Thus, 4 items were deleted from 13 items all together. The exploratory factor analysis (EFA) shows that two-factor EC with 5 items and GR with 4 items. The Kaiser-Meyer-Olkin measure of sampling adequacy was recorded at 0.83. These 2 factors explained 50.4% of total variance and had eigenvalues over 1. Reliability were checked for the new constructs: environmental concern (.66), and government regulation (.79). Table 2 is the EFA for all the constructs.

Table 2 Exploratory Factor Analysis and Factor Loadings

Items	Factors	
	1	2
EC3 I will not buy products which have excessive packaging.	.70	
EC2 I always look out for 'Save Energy' label whenever I shop for household appliances.	.67	
EC5 Whenever possible, I buy products packaged in reusable containers.	.66	
EC4 I use a recycling center or in some way recycle some of my household trash.	.56	
EC7 I only buy products such as toilet paper, face tissues and paper towels that are made from recycled paper.	.55	
GR2 The government must enforce a law requiring all household garbage to be separated into different classes for recycling.		.75
GR1 The government must preserve more land as natural wilderness and excluding it from any resource exploitation and development.		.75
GR5 The government must ban on bug and weed pesticides for lawn and garden use.		.74
GR4 The government must enforce stiff jail sentences for polluters.		.66

Correlation Analysis

Correlation analysis was tested to identify the direction and strength of the relationship among the independent variables. Table 3 depicted the internal consistency and correlation that indicated a medium strength of the relationship among the constructs. Furthermore, the results also exhibited the composite reliability value for the two factors were above .60 as suggested by Hatcher (1994). Although the variance extract for EC estimate was below .50, this situation did not cause concern since previous studies showed that it is quite frequent to find estimates below .50 even when the composite reliability is acceptable. Thus, the results indicated that the discriminant validity have been achieved.

Table 3 Internal Consistency and Correlation Matrix

Construct	α	AVE	GR	EC
Governmental Regulation	.73	.53	.82	
Environmental Concern	.66	.40	.31**	.76

NOTE: **. Correlation is significant at the 0.01 level (2-tailed)
Composite Reliabilities are shown on the diagonal

Hypotheses Testing

To test the Hypotheses 1 and 2, multiple regression analyses was conducted. The hypotheses described the relationship between EC and ECB and GR and ECB. The results of the regression for the first and second hypotheses indicated ($R^2=.3$, $F(1,209)=3.68$, $p<.01$) and ($R^2=.5$, $F(1,209)=11.38$, $p<.001$) respectively. It was found that both EC and GR have a positive relationship with ECCB ($\beta = .18$, $t = 2.59$, $p<.01$), and ($\beta = .23$, $t = 3.37$, $p<.001$) respectively. Thus, based on the results, all the hypotheses are supported (Table 4).

Table 4 The Relationship Between EC and GR with ECCB

		t- value	p - value	Result
Hypotheses 1				
EC	ECCB	2.59	.01	Supported
Hypotheses 2				
GR	ECCB	3.37	.001	Supported

DISCUSSION AND CONCLUSION

This study revealed that there was a statistically significant linear regression, which indicated a strong relationship between environmental concerns and government regulations with ecologically conscious consumer behaviour. Behaviour that does not care about ecology is the result of human attitude having the right to dominate nature. For those, (as in this study the youth) who are aware that nature has reached a critical level, make ecological adjustments that are encouraging in their behaviour. When the components of environmental attitudes are the determinants of composite ecology behaviour, external circumstances (as in this study - government regulations) identified as the most important factor in influencing the ecologically conscious consumer behaviour. The youth in this study showed having a good attitude that leads to ecologically conscious consumer behaviour. They also supported and agreed that government should play an important role in ensuring that the public is aware of ecology user behaviour as well.

In line with empirical research, it is defined that ecological conscious consumer behaviour creates two dimensions: behaviour and attitude. In this study, environmental concerns are understood as respondents' responses in purchasing products that can mitigate the environmental problems that will lead to an increase in green behaviour. The products mentioned are those that save energy and / or use recyclable, environmentally friendly and products that were produced using fewer natural resources and environmental preservation. The respondents' recognized the effect of their purchasing behaviour to the environment. Thus, the environmental concern factors are exposed as consumer actions, while giving priority to the purchase and consumption of ecological products.

The role of the government is to facilitate environmental protection. Government organizations can increase consumer awareness of environmental protection by promoting activities or videos. Knowledgeable consumers are aware that when green products are purchased, it will benefit the environment. Hence, environmental awareness influences consumers' assessment of their environmental benefits and their priorities for green products. The result from this study confirmed that the youth are aware of the consequences between good environmental concern behaviour and the environment. Therefore, government body should involve more of the young people in increasing their environmental concerns by educating them by sponsoring environmental-related media advertisements and conducting environmental protection related activities.

These activities will help young people understand how important it is to become ecologically conscious consumers even though at an early age. Besides, businesses can also play their part by providing product and environmental information on their website or via mobile software knowing that

youth is a techno-savvy. This can enhance their understanding of green concept and better yield results that generate environmental benefits. Basically, the awareness of the human environment is closely related to personal attitudes and values. Given the abundant source of information and the study of what causes environmental problems as well as a sustainable marketing policy for green products to future consumers will further enhance the level of environmental awareness among consumers especially youth.

As mentioned, the role of the government in creating an environment for sustainable use to thrive and the need to implement strategies to meet the challenges of sustainable use and development is important. One of the strategies that has been introduced by the government was the 3R - Reduce, Reuse & Recycle. In fact, too many websites and blog pages explained these 3Rs and yet many are still unaware or stubborn or unobtrusive. Due to age factor, the elderly play stupidly - they will not live longer, middle age is idiocy because busy chasing wealth and ignore the importance of the Mother Nature and the younger generation is ignorant because they never disclosed or be educated by their parents or their teachers about the 3Rs.

Therefore, integrate environmental education and cultivating ecological consciousness among the public (particularly youth) is important to ensure that sustainable consumption achieve its objectives. Almost two decades ago, this has also been supported by Mat Said et al., (2003) that as to ensure sustainable consumption take place in Malaysia, one of the strategies that government must emphasis was assimilated education and fostering environmental and ecological awareness amongst the citizen. Apart from educating the young through education, the government could encourage households and the public to make environmentally sound purchasing decisions by providing information on the consequences of their consumption choices and behaviour. Also the government could embolden healthy lifestyles by means of ensuring consumers are aware of the environmental impact of the products they purchased and consumed. Frequently and constantly use the social media as the channel to disperse this information.

LIMITATIONS AND FUTURE STUDIES

The limitations of the study are discussed as followings. Firstly, the sample size is too small. Therefore, future studies need to increase sample size and collect data from different universities, so that the results will be more accurate. Also, include not only public universities, but also private universities so that comparisons can be made in term of race differences. Moreover, future studies should observe more precise behaviours, such as the readiness to pay more for green products and bring their own consumer food bags. Upcoming researches can also investigate the effects of parents' green behaviour of their children. Finally, future studies should empirically inspect the impacts of elements such as personality characteristics as the modifiers or mediators in the relationship between environmental attitudes, concerns and green purchasing behaviour to better understand ecological conscious consumer behaviour.

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Audit Committee and Audit Fees in High Regulated Firms: Moderating Role of Regulatory Oversight

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ABSTRACT

This research is conducted under the Malaysian corporate setting that is unique due to its stringent regulatory oversight by the Bank Negara Malaysia on financial institutions. The Bursa Malaysia revamped its Listing Requirements to enhance the internal governance mechanisms, specifically on the roles and responsibilities of audit committees. Hence, it provides an opportunity to examine the association between audit committee characteristics namely independence, diligence and expertise, and audit fees from the demand side perspective for high regulated firms. The study uses multiple regression model to investigate the moderating effect of regulatory oversight and the association between audit committee and audit fees for a sample of 1045 firms-year observation during the period of 2013 to 2017. Four hypotheses are developed and tested. The results reveal that high regulated firms pay higher audit fees than less regulated firms due to its additional industry-specific regulator, which requires more audit effort thus increasing audit fees. The findings reveals shows that regulatory oversight strengthens the association between audit committee diligence and expertise, and higher audit fees for high regulated firms. However, audit committee independence is insignificant and thus rejected. Higher audit fees paid by high regulated firms act as a complementary role of the regulatory oversight function, not a substitute, for external audit monitoring. Hence, results supported the notion that regulatory oversight complements the external audit as monitoring mechanisms. This study is important to policy makers, practitioners and academic literature as it provides additional knowledge about the impact of audit committee characteristics, both high regulated firms and less regulated firms. It draws from two theories, namely, the agency theory and institutional theory, to form the framework and develop the hypotheses to be examined. The results reported in this research is based on limited sample for high regulated firms in Malaysia.

Keywords: *Corporate Governance, Institutional Theory, Audit Committee, Regulatory Oversight, Audit Fees*

INTRODUCTION

Good corporate governance is essential to economic stability and growth in developed and developing economies. Malaysia is committed to advancing the improvement of sound corporate governance systems and practices (Abdul Rahman, 2006). Indeed, it can be said that considerable progress has already been achieved. Even in the most progressive economies, there are signs that a few improvements in the capital market have outpaced the advancement of corporate administration frameworks and practice (Abdul Rahman, 2006). This is nothing new as financial policy-makers, supervisors, and regulators are always trying to catch up with the evolution of capital markets in an ever-changing world.

Expanding competition and the ongoing spate of corporate collapses have renewed attention to the effectiveness of audit pricing. The auditing profession has received much criticism for the increase in audit fees (Ciesielski and Weirich, 2006). Since the demise of Arthur Andersen, the costs associated with the much-reviled section 404 of Sarbanes Oxley (SOX) Act have made the criticism sharper (Lee

and Azham, 2008). The reason for the SOX Act is to diminish the potential outcomes of corporate fraud by expanding the stringency of procedures and requirements for financial reporting. Section 404 of the Act mandates all listed firms in the United States to set up internal controls and procedures for financial reporting as to ensure their effectiveness.

Prior studies on audit fees are generally drawn from the governance of firms in the less regulated or non-financial industry (Carcello et al., 2002; Abbott et al., 2003; Goodwin and Kent, 2006). This is because firms in the financial industry are different from firms in other industries, for they are more complex and difficult to monitor and thus, stringent monitoring and greater regulatory oversight are applied to these firms. There are two strands of prior research on the relationship between regulatory oversight and corporate governance practices by firms. The first strand finds that greater regulatory oversight complements the critical role of corporate governance. The justification is that an independent and effective board and audit committee of high regulated firms (HRFs) have more prominent impetuses to secure their reputational capital than those in less regulated firms (LRFs). They demand extra affirmation from the external auditor in order to reduce their personal risks (Abbott et al., 2003) and consequently increase in audit fees (Stoll, 1998; Adams and Mehran, 2003). Whereas, the second strand finds that regulatory oversight partially substitutes the external audit as a monitoring mechanism. According to Bryan and Klein (2005), direct monitoring by regulators decreases information asymmetries in high regulated firms as compared to less regulated firms. This is because regulatory oversight demands a greater level of responsibility and increases the risk of lawsuits if the directors failed to discharge their governance duties (Boo and Sharma, 2006). They also attribute lower audit fees to high regulated firms as compared to less regulated firms. This and other differences between high regulated and less regulated firms have led some to view regulatory oversight acts as a substitute or complement for the internal governance of high regulated firms (Stoll, 1998; Adams and Mehran, 2003).

Additionally, past studies were conducted in developed countries from different perspectives, on the impact of regulatory oversight on audit fees (i.e. Boo and Sharma, 2006 and 2008; Adams and Mehran, 2003) and studies which provide convincing evidence of audit fees in Malaysia (i.e. Abdul Wahab et al., 2009, 2011; Yatim et al., 2006, Gul, 2006) exclude financial institutions and firms in other regulated industries (Shen and Chih, 2005), such as insurance firms. As indicated by Jizi and Nehme, (2018), the impact of corporate governance on audit fees literature is lacking in the banking sector, which is subject to different regulations and reporting requirements compared to other sectors. Thus, this study extends this line of research and examines the relation between external audit fees and the enhanced listing requirements on audit committee characteristics. Therefore, it is timely to examine this audit fee-regulatory oversight nexus in Malaysia where the banking institutions and insurance firms are subject to stringent regulatory by the Bank Negara Malaysia (BNM).

Several institutions are involved in institutionalizing good corporate governance practices in Malaysia such as the Securities Commission (SC), Bursa Malaysia (BM), and Bank Negara Malaysia (BNM). This is consistent with the underlying assumption of the institutional theory on the role of regulators in promoting good corporate governance practices. Thus, it is the responsibility of the regulatory agencies having oversight authority over accounting matters (Baker et al., 2006) to restore public confidence by enforcing good corporate governance practices. The institutional theory theorized an important role for regulatory agencies to ensure that formal mechanisms are in place to ensure compliance of rules and regulations. The role of regulatory oversight is more pertinent in high regulated firms which are tightly regulated by the Bank Negara Malaysia. Using the argument that the role of governance mechanisms is

to communicate with the various actors of the corporate governance mosaic (Cohen et al., 2004), this study hypothesized that regulatory oversight strengthens the association between audit committee characteristics and audit fees in Malaysia. Hence, questions arise as to the efficacy of the corporate governance reforms at enhancing further the governance of high regulated industries, particularly the banking institutions and insurance firms in Malaysia.

We recognize our investigation from earlier research by evidencing the relationship between the important corporate governance mechanisms, in particular, the audit committee, external auditors and regulatory oversight in three ways. First, we extend the audit fees research and examine whether HRFs pay higher audit fees in comparison with LRFs in Malaysia. Second, we evidence that the relationship between audit committee characteristics and audit fees is significant for HRFs. We anticipate that this relationship to be positive on the grounds that good governance is more likely to demand higher audit quality, resulting in higher audit fees. Third, from the practical perspective, this research will provide feedback to the regulators (i.e. Bursa Malaysia, Bank Negara Malaysia, and Securities Commission) on ensuring policies that support and enhance the link between the internal governance mechanisms and external auditing.

The remainder of this paper is structured as follows. The next section explains the literature review and hypotheses development. The third section describes the research design. The results of our study are reported in the fourth section while in the final section conclusions are drawn and the implications of the study are discussed.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Regulatory Oversight

Regulatory oversight influences corporate governance practices in organizations in the following ways. Regulatory oversight partially substitutes for corporate governance and reduces the need for extensive external audit testing in high regulated firms which results in lower audit fees (Dunn and Mayhew, 2004; Bryan and Klein, 2005; Boo and Sharma, 2008). Further, close monitoring by an industry-specific regulator diminishes information asymmetries and the dimension of oversight required from the corporate governance mechanisms such as the boards of directors, audit committees, and external auditors (Demsetz and Lehn, 1985; Smith and Watts, 1992; Bryan and Klein, 2005). According to Zgarni et al., (2018), financial security law adoption and governance regulation is a substitute for strong governance mechanisms. Hence, lower audit fee was evidenced for high regulated firms as compared to less regulated firms (Boo and Sharma, 2008). Bedard et al., (2004) posit that from a governance risk perspective, the external auditors perceive lower client risks if the firm is subject to a strong regulatory oversight function coupled with having an effective audit committee and internal audit functions. The external auditors will have greater assurance that the internal governance mechanisms are operating effectively, thus the audit effort and fees are reduced.

However, according to Abbott et al., (2003), given the complementary effect of regulatory oversight for internal governance, independent directors serving on the boards of high regulated firms have more noteworthy motivating forces to protect their reputational capital and avoid litigation cost than those in less regulated firms. Further, stringent regulatory oversights enhance the critical role of internal governance mechanisms (Stoll, 1998; Adams and Mehran, 2003) and consequently increase in audit fees. With reference to Norziaton et al., (2016) regulatory oversight strengthens the relationship between internal audit function attributes and higher audit fee for high regulated firms. In other words,

as stringent prerequisites are imposed on high regulated firms due to its industry-specific regulator, the boards of directors and audit committees may demand additional affirmation from the firms' external auditors. This is because regulatory oversight demands the directors to discharge their governance duties and increases the risk of lawsuits if the directors fail to perform (Boo and Sharma, 2008). As a result, a wider scope of audit engagement by external auditors is required causing an increase in the audit fees.

Questions emerge with respect to whether governance reforms can also be effective at enhancing the governance of high regulated industries, particularly the banking and insurance firms in Malaysia which is strictly regulated by the Bank Negara Malaysia. This and other differences between high regulated and less regulated firms have led to the conflicting views on the role of regulatory oversight as a substitute or complement for the internal governance of high regulated firms (Stoll, 1998; Adams and Mehran, 2003). Hence, the existence of the regulatory oversight and audit fees gaps arguably needs to be addressed and investigated so as to offer a better and clearer understanding of corporate governance issues. In addition, as will be discussed below, it is still unclear whether regulatory oversight moderates the relationship between the audit committee characteristics and audit fees. Therefore, this study examines the moderating effect of regulatory oversight on the association between the said audit committee characteristics and audit fees for high regulated firms.

High Regulated Firms and Audit Fees

Past literature suggests that effective regulatory oversight has an influence on the firm's corporate governance. Bryan and Klein (2005) recommend that immediate direct monitoring by regulators diminishes information asymmetries in regulated industries as compared to less regulated industries. They likewise contend that regulatory oversight gives close monitoring that eventually will reduce the role of external auditing as a control mechanism. By depending on the effective external and internal monitoring processes, auditors could decrease the extent of exorbitant testing procedures in high regulated firms. Similarly, Boo and Sharma (2008) investigate the regulatory oversight impact on internal corporate governance and audit fees for a sample of 469 large United States high regulated and less regulated firms. They find that regulatory oversight impacts audit fees and the relationship between internal governance and audit fees. They ascribe lower audit fees to high regulated firms as compared to less regulated firms. Consequently, regulatory oversight can possibly diminish the important role of corporate governance key players such as the board of directors and audit committee. Greater vigilance and stronger internal control in response to close regulatory monitoring reduce the level of audit risk, which deter the need for closer review of audit examination. Corporate governance mechanisms such as the board of directors and audit committee do not require an extensive audit when there is regulatory oversight. Therefore, there will be lower audit effort and eventually lower audit fees for high regulated firms than less regulated firms (Boo and Sharma, 2008).

However, Fields et al. (2004) find that high levels of litigation risk in high regulated industries also affect the relationship between industry-specific regulated firms and auditors. When auditors are subject to extensive regulatory scrutiny, they are likely to charge higher audit fees due to the increased regulatory risks. Villiers et al., (2014) highlighted that audit fees also respond to changes in audit requirements more quickly, leading to an increase in audit fees as compared to respond toward reductions in audit requirements. As per Bedard et al. (2004), auditors deliberately react to client risks through proper audit procedures. Auditors who observe higher client risks will increase their audit effort, resulting in higher audit fees. Consequently, effective regulation and oversight of regulators give better impetuses in a circumstance where directors with reputation capital at stake demand for an

Although Malaysia has a well-developed set of regulations and rules related to corporate governance performance areas, it was rated among the lowest in the region in terms of enforcement (Miles, 2009). The reality is that enforcement has been discerning previously and is seen to be politically determined (Gul, 2006). This has incited awareness about issues concerning the role of regulators and the need for enhanced disclosure and corporate governance. Because of the ineffectual enforcement by regulators, it has uncovered a few examples of corporate maltreatment which are attributable to ineffective corporate governance structures. Thus, the foregoing argument leads to the following hypothesis stated in an alternate form:

Hypothesis 1: High regulated firms pay higher audit fees than less regulated firms.

Audit Committee Characteristics and Audit Fees

Agency theory highlighted that an effective board of directors enhance the credibility of the financial reporting process and facilitate communication between managers, external auditors and internal auditors (DeZoort, 1997). An effective audit committee characteristic will improve the corporate governance practices and higher audit fees due to the demand for additional assurance from the external auditors in order to safeguard their reputational capital (Abbott et al., 2003). It is also suggested by Sulaiman (2017) that the effectiveness of the oversight role is also influenced by the quality of the audit committee chairman and the relationship between the audit committee members and the external auditors.

Regulators emphasize the need for audit committee members to be independent and at least one member of the committee should be financially literate. Since the accounting and auditing literature draws intensely upon the agency theory, an essential focus has been comprehension of the effect of the independence of the board or audit committee or both on a number of financial reporting and auditing issues (Cohen et al., 2008). For instance, Rosenstein and Wyatt (1990) find that the appointment of outside directors was related with positive abnormal returns in the stock market. Likewise, audit committee independence and competence is significantly identified with a lower occurrence and severity of financial restatements (Larry and Taylor, 2012). Where else, firms that committed financial statement fraud were less inclined to have a strong and independent audit committee (Abbott et al., 2003; Beasley, 1996; Beasley et al., 2000). Consistent with the risk-based approach, an independent audit committee leads to an effective audit committee oversight of the financial reporting process which diminishes the occurrence of financial reporting issues (Abbott et al., 2004; BRC, 1999; Dechow et al., 1996; McMullen, 1996). Thus, it is not surprising that Abbott et al. (2003) and Vafeas and Waagelein (2007) find that audit committee independence has a significant positive impact on audit fees when the audit committee is made up of either solely or a majority of independent members. It also lends support that an independent audit committee is connected with higher audit fees due to greater demand for audit quality in order to protect its members' reputation (Abbott and Parker, 2000; Carcello and Neal, 2000). On the contrary, a study by Kee (2015) suggested that audit committee attributes are not significantly related to audit fees, which suggests that audit committee attributes have no influence on the audit fees.

Past studies and governance best practices called for audit committees to be diligent in carrying out their duties (Abbot et al., 2004; BRC, 1999; NYSE, 2002; BMLR, 2008). Further, as indicated by Yatim et al. (2006), frequent audit committee meetings can diminish the inclination for financial reporting problems as they provide a platform for the audit committee and internal auditor to exchange relevant information and to notify the external auditor of issues that require greater attention (Raghunandan et al., 1998). As found by Kalbers and Fogarty (1998) and Goodwin and Kent (2006), audit committees that meet

frequently are bound to be better educated and progressively tenacious in releasing their duties. As such, it is sensible to expect that audit committees who meet frequently will exhibit more noteworthy ingenuity in carrying out their obligations. Consequently, as supported by Yatim et al. (2006) external audit fees are positively and significantly related to the frequency of audit committee meetings. Studies by Carcello et al. (2002) and Abbott et al. (2003) which are consistent with the demand approach, argue that more diligent audit committee is likely to seek higher quality audits from external auditors, resulting in higher audit fees.

Having a financial expert on the board helps when reviewing the internal audit proposals (Read and Raghunandan, 2001) and investigating accounting irregularities. Besides, past experience and knowledge in accounting and auditing improves the accuracy of the audit examination and produces better quality of financial reporting. DeZoort and Salterio (2001) find that audit committee's professional judgments on auditor-management issues pertaining to accounting policy differed between those with and without accounting and auditing knowledge. As such, Sharma et al., (2009) reveal that audit committee accounting experts and independent directors play an important role in monitoring by demanding frequent audit committee meetings when management adopts aggressive accounting practices. Further, Gendron and Bedard (2006) reveal that an audit committee who is financially literate is more effective in adhering to best practices, and to secure a high quality of reported earnings. Thus, the more number of experts there are in the audit committee, the better will be the monitoring and adherence to best practices. According to Abbott et al. (2003), audit committee financial expertise has a significant positive impact on audit fees. Yatim et al. (2006) find a significant and positive association between audit committee expertise (proportion of audit committee members with accounting and finance qualifications) and audit fees. This is because financially literate and knowledgeable audit committee will demand for audit quality as the members are knowledgeable on technical auditing issues, and hence the increase in audit fees (Abbott et al. 2003).

The literature suggests that these characteristics impact the effectiveness of the audit committee (Beasley et al., 2000; Carcello and Neal, 2000; Abbott et al., 2004) because they play an important role in monitoring the financial reporting process. The board of directors and its sub-committees are identified as important components of internal control mechanisms for monitoring management's activities (Vafeas, 2007; Carcello, 2009; Goh, 2009). The audit committee assists the board in fulfilling its obligation to give oversight with regards to financial statements and reports, and other disclosures provided to stockholders. Further, if the external auditor perceived the client risk is higher, then more audit effort is required, resulting in higher audit fees.

Prior studies (Carcello et al., 2002; Abbott et al., 2003; Knechel and Willekens, 2006; Goodwin and Kent, 2006) suggest that audit committee members who are independent, diligent and financially literate demand expanded audit scope in order to avoid being associated with financial misstatement and to preserve reputation capital. This is because investors, depositors and regulators have direct interest and are concerned with the performance of the firm. For that reason, audit committee in an industry-specific regulated firms demand for higher external audit monitoring and auditing services. Hence, this study extends the literature by examining the impact of regulatory oversight on audit committee characteristics has on audit fees for HRFs. The study predicts that with the presence of efficient regulatory oversight coupled with audit committee independence, diligence and expertise contribute to a better internal and external monitoring and result in higher audit testing by external auditors, and hence higher audit fees. Consequently, the study predicts the following hypotheses:

The investigation predicts that the nearness of effective administrative oversight with the freedom, ingenuity and ability of a review board add to a superior inside and outside observing and result in higher review testing by outer inspectors, and thus higher review charges.

H2a: There is an association between AC independence and audit fees moderated by regulatory oversight, for HRFs

H2b: There is an association between AC diligence and audit fees moderated by regulatory oversight, for HRFs

H2c: There is an association between AC expertise and audit fees moderated by regulatory oversight, for HRFs

RESEARCH DESIGN

Data Collection

The sample data set consists 209 firms which comprised of 20 high regulated firms and 189 less regulated firms, which is equivalent to 1045 firms-year observation during the period of 2013 to 2017. The firms in the sample are listed on the main board and the data used for this study is primarily collected from DataStream and hand collected from the firms' annual report. Drawing from prior literature (i.e. Craswell and Francis, 1999; Tsui et al., 2001; Carcello et al., 2002), we posit the following audit fee model:

$$AF = \beta_0 + \beta_1TA + \beta_2NAF + \beta_3SUB + \beta_4ROA + \beta_5LEV + \beta_6LOSS + \beta_7AQ + \beta_8PRD + \beta_9REG + \beta_{10}IND + \beta_{11}DIL + \beta_{12}EXP + \beta_{13}IND_REG + \beta_{14}DIL_REG + \beta_{15}EXP_REG + \varepsilon,$$

Where:

AF	=	Audit fee paid by the audited firm (Natural logarithm of audit fees).
TA	=	Total assets (Natural logarithm of total assets).
NAF	=	Total non-audit fee paid by the audited firm (Natural logarithm of non-audit fees).
SUB	=	Number of firm's local subsidiaries.
ROA	=	Profit before tax over total assets.
LEV	=	Proportion of total liability over total assets.
LOSS	=	An indicator variable equals to '1' if the firm has made loss in any of the years and '0' if otherwise.
AQ	=	An indicator variable equal to "1" if Big4 auditor and "0" otherwise.
REG	=	An indicator variable equals to '1' for HRFs and '0' if otherwise.
IND	=	Proportions of independent non-executive directors to audit committee.
DIL	=	Number of audit committee meetings.
EXP	=	Number of audit committee with accounting or finance qualification.
IND_REG	=	Interaction between IND and REG.
DIL_REG	=	Interaction between DIL and REG.
EXP_REG	=	Interaction between EXP and REG.
ε	=	Error term.

Audit Fee Model

Audit fee is regarded as a dependent variable for this study. It is measured by the value of paid fee in Ringgit Malaysia by the firm to its auditors. Where else, audit committee independence (IND), diligence (DIL) and expertise (EXP) are the main experimental variables for this study. Several standard variables to control for cross-sectional differences associated with client size, complexity and client risk (Simunic, 1980; Craswell 1992; Gul and Tsui, 1998) are used. The set of control variables selected is consistent with the variables identified in the audit fees literature (Hay et al. 2006; Hay, 2012). The effect of firm size is controlled by using total assets (TA). Audit complexity is based on the number of directly owned local subsidiaries (SUB), (Simunic, 1980; Hackenbrack and Knechel, 1997). Client profitability (ROA) is measured by dividing the profit before tax over total assets. Loss-making (LOSS) is considered another measure of risk because it reflects the extent to which the auditor may be exposed to loss in a situation where the client is not financially strong (Simunic, 1980). To control for leverage (LEV), the ratio of total liability to total assets is used. Non-audit fees (NAF) are also included as a control variable because it is significantly associated with audit fees (Whisenant et al., 2003; Hay et al., 2006). A dummy variable for Big4 audit firm's controls for differences in audit quality (AQ), '1' if audit firms hire Big4 and '0' if otherwise (Craswell and Francis, 1999; Tsui et al., 2001). A dummy variable for regulated (REG) is incorporated to control for high regulated firms by setting '1' for HRFs and '0' if otherwise.

Descriptive statistics

Table 1 provides descriptive statistics for the continuous and indicator variables. The analysis includes the t-tests and Pearson's correlation tests between the dependent variable (audit fees) and independent variables which consisted of audit committee characteristics. Table 1 shows the means and medians between the variables during the testing periods. The descriptive analysis shows that the average audit committee IND is 90 percent. It indicates a high proportion of independent non-executive directors to the audit committee for the sample firms. Additionally, the sample firms have audit committee members that are predominantly diligent (DIL) with an average of conducting 5 meetings per annum and having financial or accounting expertise (EXP) of at least 1 in the board. Audit fees show an amount of RM356,491 during the period. This is due to significant total assets (TA) and a larger number of local subsidiaries (SUB). These firms also have a significant average amount of non-audit fees (NAF)(RM9768026) and hiring Big4 to conduct audit work (AQ).

Table 1: Descriptive data for periods 2013 – 2017 (n = 1045)

Variable	Mean	Std. Dev	Median
LAF	12.09	1.05	11.94
AF	356491.00	640995.40	155500.00
LTA	13.57	1.70	13.34
TA	5283143.50	18372.32	627154.00
LNAF ^o	4.79	9.27	9.69
NAF	9768026.00	605188.75	16302.50
SUB	21.80	22.30	21.70
ROA	0.05	0.06	0.05

LEV	0.27	0.18	0.24
LOSS	0.18	0.38	0.00
AQ	0.65	0.45	1.00
IND	0.90	0.12	0.88
DIL	5.30	2.05	5.00
EXP	1.40	0.62	1.00

* $p < 0.05$

°Observations having a zero for LNAF are re-corded to a small positive value (0.00001) to enable a logarithmic transformation.

Notes: AF is audit fees while LAF is natural logarithm of audit fees; TA is total assets (in RM) while LTA is natural logarithm of total assets; NAF is non audit fees (in RM) while LNAF is natural logarithm of non-audit fees; SUB is number of subsidiaries; ROA is net profit before tax over total assets; LEV is the proportion of total liability over total assets; LOSS is an indicator variable equals to '1' if the company has made loss in any of the years, '0' if otherwise; AQ an indicator variable equals to '1' if the company hire Big4 auditor and '0' if otherwise; IND is the proportion of independent non-executive directors to audit committee; DIL is the number of meetings; EXP is the number of AC with accounting or finance qualification.

Correlation

Table 2 shows the correlation matrix between audit fees, control variables and experimental variables. Audit committee IND, DIL and EXP have a positive and significant association with audit fees. Consistent with our expectations, the correlation matrix also shows that the correlation coefficient between regulatory oversight (REG) and audit fees is positive and significant. Except for ROA, all other variables are significantly correlated with audit fees. The signs for the control variables are all in the predicted direction in the testing periods except for the coefficient for LEV, ROA and LOSS. Since none of the explanatory variables are highly correlated ($r > 0.09$), their correlations do not indicate that Multicollinearity is a serious problem (Pallant, 2001).

Table 2: Pearson Correlation Matrix for sample firms (2013 – 2017, n = 1045)

	LAF	AF	LTA	TA	LNAF	NAF	SUB	ROA	LEV	LOSS	AQ	REG	IND	DIL	EXP
LAF	1	0.77**	0.79**	0.48**	0.36**	0.48**	0.69**	0.07	0.10**	-0.12**	0.30**	0.28**	0.18**	0.37**	0.15**
AF		1	0.67**	0.68**	0.27**	0.68**	0.65**	0.07	-0.06	-0.11**	0.18**	0.29**	0.17**	0.33**	0.09**
LTA			1	0.68**	0.34**	0.46**	0.52**	0.04	0.16**	-0.15**	0.33**	0.44**	0.17**	0.33**	0.09**
TA				1	0.18**	0.37**	0.29**	-0.09*	-0.07	-0.09**	0.16**	0.49**	0.15**	0.47**	0.13**
LNAF					1	0.29**	0.23**	0.08*	0.06	-0.05	0.27**	0.14**	0.15**	0.17**	0.08**
NAF						1	0.49**	0.08	-0.01	-0.04	0.17**	0.13**	0.08**	0.29**	0.11**
SUB							1	0.09**	0.01	-0.08*	0.12**	0.00	0.09**	0.09**	0.17**
ROA								1	-0.09**	-0.58**	0.03	-0.16**	-0.07	-0.08**	0.03
LEV									1	0.12**	0.02	0.12**	-0.03	0.07	-0.07*
LOSS										1	-0.08*	-0.05	0.07	-0.02	-0.01
AQ											1	0.13**	0.03	0.11**	0.06
REG												1	0.15**	0.28**	0.02
IND													1	0.14**	0.03
DIL														1	0.11**
EXP															1

Significant at *10, **5 and ***1 per cent levels. * $p < 0.05$; © chi-square tests

^aObservations having a zero for LNAF are re-coded to a small positive value (0.00001) to enable a logarithmic transformation.

Notes: AF is audit fees while LAF is natural logarithm of audit fees; TA is total assets (in RM) while LTA is natural logarithm of total assets; NAF is non audit fees (in RM) while LNAF is natural logarithm of non-audit fees; SUB is number of subsidiaries; ROA is net profit before tax over total assets; LEV is the proportion of total liability over total assets; LOSS is an indicator variable equals to '1' if the company has made loss in any of the years, '0' if otherwise; AQ an indicator variable equals to '1' if the company hire Big4 auditor and '0' if otherwise; REG is an indicator variable equals to '1' for HRFs and '0' if otherwise; IND is the proportion of independent non-executive directors to audit committee; DIL is the number of meetings; EXP is the number of AC with accounting or finance qualification.

RESULTS AND DISCUSSION

T-tests and Chi-Square Tests for High Regulated Firms

Table 3 shows the results for the differences between HRFs and LRFs. The results highlight significant differences between the two groups except for SUB, LOSS, AQ and audit committee EXP. The analytical procedure is applied to answer the hypothesis as to whether HRFs pay higher audit fees than LRFs. In comparison of the two groups, the AF is statistically different for both sub-sample firms at five (5) percent significance level ($t=-8.53$, $p<0.05$). HRFs experience higher audit fees than LRFs ($\mu=\text{RM}1,084,256.40$, $\mu=\text{RM}347,169$), thus fully support H1. This is due to HRFs are larger in terms of size (TA) and at the same time hire the Big4 auditors to audit their financial statements (AQ).

Given the t value of -9.13 with a significant level of $p<0.05$, the audit committee independence (IND) is statistically significant for both groups. From this data, it shows that HRFs have higher level of audit committee independence. Additionally, the audit committee diligence (DIL) is also significantly different at $p<0.05$ with HRFs audit committee members meeting more frequently at an average of 7 to 8 times in a year as compared to LRFs whose average is 6 times per annum.

Table 3: T-test results for High Regulated Firms and Less Regulated Firms for sample firms (2013 – 2017, $n = 1045$)

Variable	Highly Regulated Firms ($n=100$)		Less Regulated Firms ($n=945$)		T-test
	Mean	SD	Mean	SD	t-value
LAF	13.89	1.35	12.79	1.29	-8.53*
AF	1084256.40	1558515.60	347169.38	579473.90	-5.48*
LTA	16.39	2.02	14.53	2.15	-13.42*
TA	42279873.00	61110876.02	3108390.00	9422653.80	-6.89*
LNAF ^a	9.34	8.09	5.13	10.63	-5.58*
NAF	494036.36	1093045.20	175601.18	651935.94	-3.08*
SUB	23.49	22.27	22.25	33.81	0.05
ROA	0.07	0.05	0.08	0.07	8.45*
LEV	0.54	0.47	0.36	0.28	-3.37*
LOSS	0.18	0.42	0.29	0.58	0.31
AQ	0.98	0.40	0.75	0.54	0.00
IND	0.99	0.19	0.98	0.26	-9.13*
DIL	7.58	4.79	6.08	1.82	-5.28*
EXP	2.45	1.26	1.93	0.81	-0.99

* $p < 0.05$; ^a chi-square tests

^aObservations having a zero for LNAF are re-coded to a small positive value (0.00001) to enable a logarithmic transformation.

Notes: AF is audit fees while LAF is natural logarithm of audit fees; TA is total assets (in RM) while LTA is natural logarithm of total assets; NAF is non audit fees (in RM) while LNAF is natural logarithm of non-audit fees; SUB is number of subsidiaries; ROA is net profit before tax over total assets; LEV is the proportion of total liability over total assets; LOSS is an indicator variable equals to 1 if the company has made loss in any of the years, 0 if otherwise; AQ an indicator variable equals to 1 if the company hire Big4 auditor and 0 if otherwise; IND is the proportion of independent non-executive directors to audit committee; DIL is the number of meetings; EXP is the number of AC with accounting or finance qualification.

Multivariate Analysis

The multiple regression results for testing the hypotheses are presented in Table 4. Models A and B are significant at one percent significance level ($p=0.000$) with an adjusted R^2 of at least 75 percent. The coefficients on the control variables across the two models are in the predicted directions. Overall, the models are structurally stable. The results in Model A show the association between external audit fees on seven (7) control variables derived from Gul, (2006); Boo and Sharma, (2008); Yatim et al., (2006); and Abdul Wahab et al., (2009). According to Simunic, (1980); Francis and Simon, (1987); Craswell et al., (1995), it is expected that the audit fees are positively associated with total assets (TA), non-audit fees (NAF), number of local subsidiaries (SUB) audit quality (AQ) and loss (LOSS). All other variables remain significant with the exception of LOSS and audit committee EXP. TA is positive and significant at one (1) percent level of significance (0.44, $t=18.33$), indicating that the bigger the size of audit client firms' the higher the audit fees charged by the external auditors. The coefficient of NAF (0.07, $t=3.88$) is also significant and positive at $p=0.001$. Besides that, audit complexity measured by SUB coefficient is found to be positive and significant at one (1) percent significant level. Past studies confirm that the more complex an audit client, the harder it is to audit and is more time-consuming (Simunic, 1980; Hackenbrack and Knechel, 1997). AQ is positively associated with audit fees which strongly support the observation that the Big4 is associated with higher audit fees.

Similarly, ROA is negatively significant at one (1) percent level ($p<0.01$), indicating the extent to which the auditor may be exposed to higher risk in the event that the audit client is not financially viable (Simunic, 1980). LEV is also negatively significant at one (1) percent level ($p<0.01$). It is another measure of risk of a client failing, which potentially exposes the auditor to loss (Simunic, 1980). Positive and significant ($p<0.01$) coefficient on REG is also observed. This is to confirm that HRFs pay comparatively higher audit fees than LRFs. This is consistent with the argument that regulatory oversight complements the external audit monitoring, hence higher audit fees. This is because the audit committee members demand for extensive audit test even though HRFs have stronger internal controls and internal monitoring. Audit committee IND and DIL coefficient is positive and significant (0.07, 0.13, $t=3.74$, $t=6.82$, $p<0.01$).

Table 4: Audit fee regression models (n =1045) (dependent variable is log audit fees)

Variable	Model A		Model B		Model C		Model D	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		33.93		33.12		33.54		33.82
LTA	0.48	19.13**	0.49	18.26**	0.46	18.63***	0.45	18.43***
TA	0.08	2.58**	0.06	2.28**	0.07	3.30***	0.06	2.76***
LNAF	0.07	3.89***	0.07	3.62***	0.05	3.67***	0.05	3.53***
NAF	0.08	3.98***	0.09	3.80***	0.08	4.01***	0.08	4.02***

SUB	0.65	18.57***	0.61	18.11***	0.55	18.31***	0.55	18.24***
ROA	-0.09	-3.85***	-0.09	-3.75***	-0.07	-3.73***	-0.07	-3.65***
LEV	-0.19	-4.51***	-0.13	-4.13***	-0.10	-4.14***	-0.09	-4.03***
LOSS	0.08	0.79	0.06	0.72	0.01	0.75	0.01	0.65
AQ	0.09	4.19***	0.07	3.92***	0.06	3.86***	0.06	3.92***
REG	0.10	4.67**	0.15	0.68	0.04	1.17	0.02	0.57
IND	0.07	3.74***	0.08	3.64***	0.09	3.40***	0.05	3.47***
DIL	0.13	6.82***	0.16	6.83***	0.10	3.41***	0.11	6.39***
EXP	0.05	0.91	0.07	0.95	0.00	0.59	0.02	1.44
IND_REG			0.15	2.42**				
DIL_REG					0.17	2.99***		
EXP_REG							0.12	2.37**
F- statistic		198.81		187.22		187.23		187.50
p-value		0.00		0.00		0.00		0.00
Adj. R ²		0.75		0.77		0.77		0.78

°Observations having a zero for LNAF are re-coded to a small positive value (0.00001) to enable a logarithmic transformation.

Notes: AF is audit fees while LAF is natural logarithm of audit fees; TA is total assets (in RM) while LTA is natural logarithm of total assets; NAF is non audit fees (in RM) while LNAF is natural logarithm of non-audit fees; SUB is number of subsidiaries; ROA is net profit before tax over total assets; LEV is the proportion of total liability over total assets; LOSS is an indicator variable equals to '1' if the company has made loss in any of the years, '0' if otherwise; AQ an indicator variable equals to '1' if the company hire Big4 auditor and '0' if otherwise; REG is an indicator variable equals to '1' for HRFs and '0' if otherwise; IND is the proportion of independent non-executive directors to audit committee; DIL is the number of meetings; EXP is the number of AC with accounting or finance qualification. IND_REG is an interaction term; DIL_REG is an interaction term; EXP_REG is an interaction term.

Model B brings in the interaction variable (REG) to test the hypotheses. It comprises of three (3) individual Models I, II and III on audit committee characteristics and their interactions with regulatory oversight. The interaction term DIL_REG (audit committee diligence by regulatory oversight) is positive and significant (0.17, $t=2.99$, $p<0.01$). The positive coefficient for the interaction variable reveals a stronger positive association between audit committee DIL and audit fees for HRFs. It is consistent with the demand-based perspective that diligent audit committees demand for additional assurance from external auditors to ensure effective oversight over financial statement audit and to protect their reputational capital (Carcello et al., 2002, Abbott et al., 2003). This result is in line with our expectation in Hypothesis 2b, which posits positive association between audit committee DIL and audit fees implementation for HRFs, thus fully support Hypothesis 2b.

Similarly, the coefficient on the interaction term EXP_REG (audit committee expertise by regulatory oversight) is positive and significant (0.12, $t=2.37$, $p<0.05$). This result is consistent with our expectation in Hypothesis 2c, which posits that the association between audit committee EXP and audit fees for HRFs, thus fully support Hypothesis 2c. It is important to note that the interaction variables on audit committee characteristics and higher audit fees observed in this study is consistent with the demand side perspective of the audit fee phenomenon. It proposes that improved monitoring by the audit committee members seek higher audit quality.

Such greater assurance provided by the external auditors requires an additional audit work which is reflected in higher audit fees. Since one of the primary responsibilities of the audit committee is to review and monitor the audit process, active and independent audit committees can influence the extent

of the audit (DeZoort, 1997). Hence, we find that industry-specific regulatory oversight influences audit fees and the association between audit committee characteristics and audit fees. We attribute the higher audit fees paid by HRFs to the complementary role of the regulatory oversight function as complement, not a substitute, for external audit monitoring. The remaining of the interaction variable term IND_REG is insignificant and thus, do not support H2a.

Hence, it can be said that the analysis above complies with the Guidelines on Corporate Governance for Licensed Institutions by Bank Negara Malaysia (2008) which emphasised on the direct authority and supervision of the audit committee. Besides that, these findings are also consistent with the comprehensive disclosure requirements for better understanding of the financial and management position of the HRFs, particularly in relation to its internal governance practices. As supported by Adams and Mehran (2003) that the boards of directors of HRFs are placed in a crucial role in the governance structure. Although the boards of HRFs are assigned the same legal responsibilities as the boards of LRFs, regulators have placed additional expectations on HRFs, resulting in the boards delineating their responsibilities even further. Consequently, the internal governance mechanisms quality will impact the quality of corporate governance (Gramling et al., 2004). Therefore, it can be concluded that firms that are committed to strong corporate governance are willing to pay for a higher quality external audit (Goodwin and Kent 2006).

CONCLUSION

The Bursa Malaysia Listing Requirements provides a greater obligation for both high regulated and less regulated firms to enhance Malaysia's corporate governance regime. The panel analysis of 1045 firms-year observation for a period from 2013 to 2017 shows that HRFs pay higher audit fees due to an additional industry-specific regulator i.e. Bank Negara Malaysia, which requires more audit effort, thus an increase in audit fees. Similarly, regulatory oversight strengthens the association between audit committee DIL and EXP, with higher audit fees for HRFs. The results indicate that external auditors perceived HRFs which are being monitored by BNM, require more audit effort, thus increase in audit fees. This is consistent with the notion that regulatory oversight complements the external audit as monitoring mechanisms. The application of institutional theory in this research supports the argument that an institution plays an important role in monitoring the operation of the firms. In addition, the establishment of regulatory agencies helps to promote corporate governance best practices, formulating and enforcing the accounting standards applicable to listed firms. Thus, it can be said that the additional-specific regulator i.e. BNM has put high expectations on HRFs, which requires audit committee members to take a more pro-active and independent role in the monitoring process. In sum, it can be concluded that audit fees have significantly increased due to compliance with the regulatory requirements. The corporate governance reforms do matter as firms that are committed to strong corporate governance are likely to engage in greater levels of external auditing and are willing to pay for a higher quality external audit fee.

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Exploring Students' Error in Quadratic Word-Problem Using Newman Procedure

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ABSTRACT

Mathematics worded problem solving is one of the difficult area for students. Some students were able to understand the question's requirements but applied inefficient strategy to solve it which caused errors in their way of writing the solution. As it become more complex to adapt with real life and career in the future, it is important to detect students' commonly made errors at the early stage. Teachers should also focus on improving students' understanding before students move to the next level. In addition, issues of gender differences in mathematical errors must be look into depth to tackle their learning styles and thinking. Therefore, the aim of this study is to analyse students' performance and to determine the types of errors that occur in students' quadratic word-problem solving. This study also compares the different kinds of errors showed by male and female students in solving quadratic word problems. As many as 151 students were involved in answering six quadratic equations test. Their answers were then analysed to determine the performance, the type of error made and to identify the students individually. Next, 11 students who had been identified as the the students who made most error were interviewed. The items in the interview were adapted from Newman's Error Analysis which includes five types of errors such as reading, comprehension, transformation, process skills and encoding. In this study, carelessness errors was added as a factor to indicate students who were passed the five errors but mistakenly came out with the wrong final answer. The findings showed that the students' performance in solving quadratic word-problems is high, the errors commonly made by female students were comprehension, transformation and carelessness, while the male students dominating the highest frequency in transformation error.

Keywords: *word-problem, students' error, Newman Model, gender differences, mathematics achievement*

INTRODUCTION

Mathematics items in school assessment usually comes in different forms such as in symbolic equations and word problems. However, there are three different methods that can be used write solution of quadratic equation problems; using formula, completing the square and factorisation. A study conducted by Sonnerhead (2009) mentioned that between using formula, completing the square and factorisation, the factorisation was the most preferable method used by students especially if the question is easily factorable. Other than that, students think that it was easier as the factorisation focuses more on symbolic part. Other than factorisation, some scholars had conducted studies to identify students' performance in quadratic equation word problems. Scholars noted that secondary schools students felt that quadratic equations is the most challenging conceptual (Vaiyavutjamai, Ellerton & Clement, 2005) which proven by (Effandi Zakaria & Siti Mistima Maat, 2010) that highest errors done by students was in quadratic equation compared to other mathematics topic and it was highlighted as the most difficult topic after linear equation word problems (Didis & Erbas, 2015).

The Newman's Error Hierarchy Model (1977) consists of five types of errors which are reading, comprehension, transformation, process skills and encoding. Many studies used Newman's Error Hierarchy Model to identify the types of error performed mostly by students in solving quadratic equations (Lima, 2008; Effandi Zakaria & Siti Mistima Maat, 2010; Singh, Rahman & Teoh, 2010; Makgakga, 2014; Tal, de Lima & Healy, 2014; Sumule, Amin, & Fuad, 2018 and Santoso, Farid, Ulum, 2017). Makgakga (2014) found the students had difficulties in applying completing square method in writing quadratic solutions. Other studies (Lima, 2008 and Tall et al., 2014) mentioned in their studies that the reason why students weak in formulating and writing quadratic solutions was because of the students demonstrated minimal of understanding on the procedures of linear equations. Other scholar reported students paid more attention to mathematical symbol method which cause them to make transformation error and process skills error while working on operation with quadratic. It was also agreed by Vatyavutjamai and Clements (2006) that the students lack relational understanding and instrumental understanding of the specific mathematics related to solving quadratic equations. Other than that, sometimes errors can occur in written or oral form which can be seen when students experience problems in writing mathematical solution because to solve mathematical word problem requires them a higher problem solving skill. It reported by Effandi Zakaria and Siti Mistima Maat (2010) that students who already know the solution steps were still made error in their final answer. This type of error known as careless error.

Conventionally, word problems appear as application problems (Verschaffel, Greer & de Corte, 2000) and Kieran (1992) exposed that many students struggled when dealing with algebra word problems because of the gap formed by the formal algebraic systems which was used to represent the relationship within the problem. It is believed that there are many other factors that influence students to make mistakes in solving quadratic equation problems. Since other mathematics components such as statistics, quadratic functions and calculus has relation with quadratic equation, thus it is important to identify the type of errors made by students in solving quadratic equation at the early stage to avoid making mistakes in other related topics. Unfortunately, very little attention was being paid towards quadratic equation in mathematics literature and there was scant research on teaching and learning in this topic (Vaiyavutjamai & Clement, 2006). Therefore, this study adapted Newman's Error Hierarchy model to analyse students' errors in solving quadratic equation worded-problems.

The specific objectives are:

1. To determine students' performance in solving quadratic word-problem.
2. To determine the types of error that occurred in students' quadratic word-problem solving.
3. To compare the types of error committed by male and female students in solving quadratic word problem.

LITERATURE REVIEW

Newman's Error Hierarchy Model

White (2010) stated that the conceptual of Newman Error Analysis (NEA) was designed by Newman in 1977 that can be used to examine which level of errors committed by students in solving word problems and it was also found fit in mathematics (Effandi Zakaria & Siti Mistima Maat, 2010). It had been used by other researchers such Singh et al. (2010), Effandi Zakaria and Siti Mistima Maat (2010), Sumule et al. (2018), Santoso et al. (2017) in their studies. Singh et al. (2010) cited in their works, Newman (1977) suggested that a person needs to pass over five successive levels of hurdles in order to attempt to an answer a written standard mathematics problem which are reading (or decoding), comprehension,

transformation, process skills, and encoding. Reading level is used to examine whether the student faces any problem diagnosing written words and symbols which then lead to failure in relating the content and context of some problem-solution. Comprehension level examine whether a student understands the question requirement in attempting to come out with problem-solution or whether they fail to understand its requirement although there is no problem in reading level. Transformation level identifies student has no difficulties in reading and comprehension level but is unable to formulate the best possible numerical operation or arrangement of operation to effectively come out with mathematics solution method. In process skills level, student should possess on how the solution the one problem is carried out step by step successfully that eventually shows the correct final answer. Encoding level refers to students' ability to write the final answer correctly on the paper including the correct format, unit and numbers.

A year after this model were released, all these levels had been used by Casey (1978) to identify errors made by students and came out with findings that showed students made more than just one error in a question (White, 2010). The implications of adaptation of the Newman's model in Casey's study had gained attentions of many teachers to do research on students' ability in Process skills level. Then The Newman's model was widely used by many other researchers such as, Clarkson (1991) in his study revealed that comprehension error had the higher frequency among students while Sumule et al. (2018) showed transformation and comprehension stages contributed to a large proportion of errors throughout their study.

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From the analysis of Newman's Error Hierarchical Model (1977), a conceptual framework was constructed focused on analysing the types of errors occur in students' quadratic word- problem solving. Student's ability to solve quadratic equation until encoding level is dependent on the previous level which means students must possess their ability to pass each level before moving to the next level, and that is why it is called a hierarchy model.

RESEARCH METHODOLOGY

The goal of this research paper is to determine the students' achievement and types of errors committed by students in answering quadratic word-problems. The sample study was taken from 6 different classes of a secondary school at Shah Alam, Malaysia which made it in total of 151 students. In the first phase, six quadratic word-problems were distributed to all sample students and they were given 45 minutes to finish. All six of the quadratic word-problems were constructed to assess students' comprehension aspect and achievement in working on the application of quadratic equations in changed context. To make sure the test items are in the curriculum context and can be used for the study, a teacher with more than 5 years of teaching experience was asked to do the validation process. After all students' answers were gathered, the data was evaluated and categorised as blank, incorrect, correct or incomplete. Then, the frequency and descriptive statistics of quadratic word-problems test were run using SPSS software and tabulated in tables

Ten minute semi-structured interviews were carried out one day after the test to make sure the validity of the interviews, as recommended by Didis & Erbas (2015). Five female and 6 male students were selected for the interview. The selection was made according to the number of errors found in previous quadratic word-problem test. The interviews were carried out using Newman Error Hierarchy Model (1977) which aimed to determine types of errors committed by the students that includes reading, comprehension, transformation, process skills, and encoding type errors. Another type of errors which is carelessness was included in the study because it was spotted throughout the interview session when the student was able to show the solutions but ended up with the wrong final answer. Though, this study is not to generalize the whole population because it only involved small sample for the quadratic word-problem test and for the interview.

FINDINGS

Objective 1

Table 1 shows the frequency of students' achievements from the quadratic word problem test and each response of each item was grouped into one of the four categories accordingly.

Table 1 Frequency of students' achievements in four different categories

Item	Blank <i>f</i> (%)	Incorrect <i>f</i> (%)	Correct <i>f</i> (%)	Incomplete <i>f</i> (%)
1	3 (1.99)	4 (2.65)	142 (94.04)	2 (1.32)
2	6 (3.97)	8 (5.30)	134 (88.74)	3 (1.99)
3	17 (11.26)	14 (9.27)	109 (72.19)	11 (7.28)
4	35 (23.18)	12 (7.95)	87 (57.62)	17 (11.25)
5	44 (29.14)	15 (9.93)	81 (53.64)	11 (7.29)
6	32 (21.19)	4 (2.65)	86 (56.96)	29 (19.20)

The table above shows 142 students were able to score on item 1 whereas 15 students came out with incorrect answers on item 5, and as many as 44 students left item 5 unanswered. On the other hand, item 6 has the highest frequency (29 students, 19.20%) on incomplete category as compared to the other items.

Table 2 Mean Score of Each Item

Question	N	Lowest	Highest	Mean	Std. Deviation
1	151	.00	5.00	4.8212	.84132
2	151	.00	5.00	4.5430	1.40824
3	151	.00	5.00	3.9338	1.90322
4	151	.00	5.00	3.3974	2.17280
5	151	.00	5.00	3.1457	2.27273
6	151	.00	7.00	4.9139	2.90044
Overall Mean score	151	6.25	100.00	80.1738	24.00371

Item 1 until 5 has a full score of 5 marks whereas the full score for item 6 is 7 marks. It can be seen item 1 that the highest mean score (Mean = 4.8212) which indicate that a big number of the students managed to scored on this item. On the other hand, item 5 has the lowest mean score (Mean = 3.1457) indicated that a big number of the students made errors in solving the item. The analysis also shows moderate achievement on item 6 with the mean score 4.9139 out of 7. Meanwhile the standard deviation of item 1 was the smallest (SD = 0.8132) amongst all which indicates that the spread of these items' scores is the smallest amongst all items. However, item 6 has the largest standard deviation (SD = 2.90044) specify that this item has the widest spread of set of data and it might affected by some outliers (extremely low scores).

Based on result shown in Table 2, the mean percentage of students score is at lowest = 6.25% and highest = 100%. The distance between the standard deviation with the mean is large (SD = 24.00371). However the overall mean score achieved by students in the test is 80.1738 which is high and it can be said that the students' performance level on solving word problem quadratic equation is excellent.

Objective 2

To achieve the second objective, 11 students were selected for an interview to identify how they came with the error. This section shows the result of errors made by students Exploring Students' Error in Quadratic Word-Problem Using Newman Procedure accordingly to Newman's Error Hierarchy Model. There is no reading error found in this study, thus only the other four errors are discussed in this section.

Comprehension Error

Question 5 : The area of a rectangle is 1260 m². Find the dimensions of the rectangle one side is 48m longer than three times the other side.

Example: In- Interviewer, S4 –Student Number 4

After student read the questions, the interviewer asked:

In : Very good. Now, what does the question wants you to do?

S4: Err, to find the dimension of the rectangle. Hmm.. actually I am not sure what is the dimension meaning (I don't know the meaning of dimension)

In : You're not sure? Well..in your own words, what is the meaning of dimension?

S4: I mean like, it is something like dimension or something like a 3D.

In : As you said, to find the dimension of the rectangle. Rectangle is 2 dimensional, not 3 dimensional.

S4: I see..

In : Let's look back at the question, what does '48m longer than the three times the other sides' means?

S4 : (Thinking in silent)

In : Alright, let's see the correct answer. (Interviewer showed to the student the correct answer) Can you point out the mistake in your answer?

$$\begin{aligned}xy &= 1260 \text{ m}^2 \\y &= x + 48 \text{ m} \\x(x + 48) &= 1260 \\x^2 + 48x &= 1260 \\\cancel{x^2 + 48x} - 1260 &= 0 \\x(x + 48) &= 1260 \\x^2 + 48x &= 1260 \\x^2 + 48x - 1260 &= 0 \\x &= 18.85 \qquad x = -66.85 \\&\text{(Not accepted)} \\x &= 18.85\end{aligned}$$

Fig 1 Student's sample answer on comprehension error

Exploring Students' Error in Quadratic Word-Problem Using Newman Procedure

The student was able to read the question but fail to understand the question requirement and misunderstood the meaning of "dimension". The student was confused with the word "dimension" and interpreted it as three dimensional. Other than that, the students also did not understand the meaning of '48m longer than the three times the other sides' which then failed him to move to transformation level.

Transformation Error

Question 5 : The area of a rectangle is 1260 m². Find the dimensions of the rectangle if one side is 48m longer than three times the other side.

longer than three times the other side.

(5.)

$$xy = 1260$$
$$y = 3x + 48$$
$$x(3x + 48) = 1260$$
$$3x^2 + 48x - 1260 = 0$$
$$x^2 + 16x - 420 = 0$$
$$(x - 30)(x + 14) = 0$$
$$x = 30, x = -14$$

x cannot be negative

$$y = 3(30) + 48$$
$$= 144$$

value

Fig 2 Student's sample answer on transformation error

Figure 2 shows that the student made transformation error as he did not use the correct operator in the equation. The exact answer is $3x+48$ but the student stated $3x-48$. When the students commit transformation error, they cannot perform the next step in process skill and encoding level

Process Skill Error

Question 2: The product of two numbers is 65. Their differences is 8. Find these two numbers.

(5 marks)

$$\begin{aligned} \alpha\beta &= 65 \quad \text{--- ①} \\ \beta - \alpha &= 8 \quad \text{--- ②} \\ \beta &= 8 + \alpha \quad \text{--- ③} \\ \text{Sub ③ in ①} & \quad \text{--- ④} \\ \alpha(8 + \alpha) &= 65 \\ 8\alpha + \alpha^2 &= 65 \\ \alpha^2 + 8\alpha - 65 &= 0 \\ \alpha^2 + 8\alpha + \left(\frac{8}{2}\right)^2 - \left(\frac{8}{2}\right)^2 - 65 &= 0 \rightarrow \\ (\alpha + 4)^2 + 16 - 65 &= 0 \quad \alpha \\ (\alpha + 4)^2 &= 49 \\ \alpha + 4 &= \pm\sqrt{49} \\ \alpha + 4 &= 7 \quad \text{OR } \alpha + 4 = -7 \\ \alpha &= 7 - 4 \quad \alpha = -7 - 4 \\ \alpha &= 3 \quad \alpha = -11 \end{aligned}$$

On the right side of the page, there is a separate calculation:
$$\begin{aligned} \beta - (3) &= 8 \\ \beta &= 8 + 3 \\ \beta &= 11 \end{aligned}$$

Fig 3 Student's sample answer on process skill error

In process skill sample above, the student comprehended the question's content well but she was having problem when dealing with completing the square method. Despite being familiar with this method and that was the reason she chose to use this method, it was recorded that she committed procedural error in her calculation which denoted as process skills error in Newman's model.

Encoding Skill Error

Question 6: We throw an object upward from the top of a 1200 ft tall building. Find the height of the object (measured in feet) t seconds after we threw it.

Hint : find t when $h(t) = 0$

$$\begin{aligned} \text{a) } h(t) &= -16t^2 + 160t + 1200 \\ h(3) &= -16(3)^2 + 160(3) + 1200 \\ &= -144 + 480 + 1200 \\ &= 1536s \end{aligned}$$

The final result 1536s is marked with a large red 'X', indicating an encoding error.

Fig 4 Student's sample answer on encoding error

Based on the interview, the student was able to read, comprehend and make procedural solution. However, the final answer stated as shown in figure 4 is 1536s which did not comply with the question's needs in feet for the object's height. Therefore, it is said that this student committed encoding error.

Based on table 3, It revealed that most students were facing transformation error (10 students) followed by comprehension error (9 students) in the test. On the other hand, there was no students confronted with difficulty in reading. However, 3 students faced process skills error in the test and 6 students showed having error of encoding and carelessness.

Table 3 Frequency of Error Made by Students

Item	Reading	Comprehensor	Transformation	Process skills	Encoding	Carelessness
1	0	0	0	0	0	2
2	0	0	3	0	0	2
3	0	2	1	0	1	0
4	0	4	1	0	1	1
5	0	3	3	0	2	0
6	0	0	2	3	2	1
Total	0	9	10	3	6	6

Objective 3

Table 4 shows there was in total of 22 errors occurrence from four levels of Newman's Error Hierarchy Model and carelessness found committed by the male group of students which made this gender has the highest frequency error in the test with the most mistakes fall at transformation error. On the other hand, female students revealed the highest frequency at three errors which are comprehension, transformation and carelessness.

Table 4 Gender Differences: Frequency of Error Made by Students

	Male	Female
Reading	0	0
Comprehension	6	3
Transformation	7	3
Process skills	2	1
Encoding	4	2
Carelessness	3	3
Frequency	22	12

DISCUSSION

The sample students were given a set of quadratic word-problem test that consisted of factorization, completing the square method and formula as the content in the quadratic worded-problem test. Based on the quadratic word-problem test, the results showed that the majority of the sample students managed to answer all the six questions correctly. Out of these six questions, it was found that students scored the highest to the lowest moving from item 1 to item 6. More than 85% of the sample students scored correctly on item 1 and 2, this is because the students were from mathematics clustered school and these two items were not tricky to the students as these items were at low level order. It is not surprise that majority of the students were able to answer them without any complex problem. On the other hand, despite item 3, 4 and 5 were placed at the moderate level order and more challenging to the students because they were intended to enhance students' critical thinking, more students (72.19%) managed to answer item 3 correctly compared to item 4 and 5. This was due to students having problems at comprehension level while answering item 4, and faced problems at comprehension level and transformation level while answering item 5. Lastly, item 6 was more related to real life situation that requires the students to think critically and relate all the methods that they have learned to solve it. It was found that more than half of the sample students (56.96%) were able to answer item 6 correctly but it was also quite a number where 21.19% of the sample students left the item blank. This was due to them having problems at transformation, process skill and encoding level while solving item 6. Other than that, even though the score is high but from the errors that they committed in item 6, it indicates that the students still have difficulty in relating what they had learn theoretically to the real life situation. This also influenced the failure in solving item 6.

From this the overall students' achievement in quadratic word-problem test, the result is high does not mean that the sample students are good in that area. Further analysis must be conducted to understand some particular error that might occur during mathematical formulation. It can be seen from this study's sample answers what type of errors occurred and how students end up with such mistakes. Therefore, it is important for the students to eliminate those error in the current topic, so that it will not be a problem for them when it's time to move to next level of mathematic topics. This is also supported by Sumule et.al (2018) that teacher must pay extra attention students' mathematical error at the early stage to enhance students' skill and because if this matter is not been taken seriously, not surprisingly that today's error would affect students' learning in the higher level of mathematics topics. In the teaching and learning context of these 6 classes, the teacher used drill and practice method to train students to do well in mathematics as they were in mathematics clustered school. Thus, it was not surprised that all of the students passed the reading level as how it was found during the interview. Knowles (2010) also found that daily drill practice strategy in mathematics had become an important tool that helped students enhance their computational thinking and mathematics fluency.

From the interview data analysis, it was found that the greatest number of errors that the students made in the test is transformation error which can be pointed out from item 2 and item 5. This finding is agreed by another researcher who had conducted on fraction topic, Abdul Halim Abdullah , Nur Liyana Zainal Abidin and Marlina Ali (2015) and found that the students were facing problems at the transformation, process skill and encoding level. On the other hand, Effandi Zakaria and Siti Mistima Maat (2010) stated that process skill error was the most frequent error commit by students in solving factorization, completing the square and by using formula in solving quadratic word-problem. However, Singh et al. (2010) found comprehension and transformation were the two error most committed by rural and urban pupils.

Newman (1977) also showed similar result in his study which transformation was the second highest percentage (12%) as cited by Singh et al. (2010). Regarding to transformation error, researchers agreed that many students were having hard time to convert worded problems into mathematical symbols. The reason behind this may be because of English language is not the students' first language which contribute to problems in writing question requirement into mathematical forms or it may be because of other factors such as misconception and misunderstanding. For example, , the students sometimes jumbled between the mathematical terms and concept in the test item, such as "3 metre shorter than twice the other sides", "4 inch shorter than three times the other sides" and "48 metre longer than three times the other sides". These word-problems make a number of students fail to convert the word-problems into mathematical terms. This was agreed by Abdul Halim Abdullah et al. (2015) that students failed to understand and explain the mathematics concept, thus led to failure in transforming word-problem into equations. Failure to comprehend mathematic word problem will cause failure in solving the problem (Salma Jan & Sherwin Rodrigues, 2012). Thus, some changes need to be made in classroom where teaching and learning must be conducted more systematically to ensure comprehension, concept and process could work together.

Results from table 4 reveal gender differences in making mathematical error. Male group's error occurrence can be found in all level except reading error with greater notable number compared to female group. While comprehension error, transformation error and careless were found in female group with small number of occurrence. From the researcher eyes, different gender has it own unique way of working on something and different way of thinking. It had been well-known that female students showed grades better than male students in mathematics, they put more effort on doing task to achieve better grades and mindful about getting excellent achievement in school (Brown & Kanyongo, 2010). From this study point of view, teachers should be committed in taking responsibility to analyse ways of different gender think and recognise each student's potential to help them avoid from doing mistakes in quadratic problem solving. It is the educator's responsibility to ensure the students have master the basic topic before moving to the next topic which is higher than the previous.

CONCLUSION

In Malaysian educational system, paper based test, written test and higher achievement are still the main concern. This study aligned with Santoso et.al (2017) to resolve expansively students' error in mathematics by teachers and students, post-test evaluation should be stressed more by looking systematically into the error patterns. The students showed high performance in the test but there were a number of different types of error found in the sample answers. This study found the highest occurrence of transformation error, followed by comprehension error, encoding error, carelessness, process skill and none in reading error. Therefore, teacher and student must understand the importance to eliminate these errors in quadratic word-problem. If these errors is not being taking care of at the early stage, it will give a big impact to the students' learning mathematics in the future. This study could give information to other researcher, teacher and academic institution on exploring types of mathematical error by looking into the method and findings section covered in this study. In a nutshell, teachers should be wiser in using concept and choose the language that familiar to the students. More effort should be put in the teacher to notice that comprehending word problem and applying effective solving strategies are important aspects to be taken care of before the students can move to the next level.

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The Study of the Factor that Influence Attitude Towards Viral Marketing Among Generation Y

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ABSTRACT

The rapid growth of internet and the use of e-commerce have made viral marketing an appealing marketing method for most firms and marketers to promote and advertise their products or services. However, before involving with viral marketing, firms and marketers need to learn and recognize whether the customers will react positively or negatively towards it. Thus, it is important for firms and marketers to understand the factor that influence customer's attitude towards viral marketing. In this research study, the purpose is to investigate and examine whether the factor of informativeness, entertainment, source credibility, and irritation will affect attitude towards viral marketing. This study was conducted to focus on the generation Y in Johor, Malaysia. Based on the results that have been retrieved in this study, it was found that the independent variable of source credibility has a significant relationship with the dependent variable of attitude towards viral marketing. While, the other independent variables which is informativeness, entertainment and irritation is found to have no significant effect on attitude towards viral marketing.

Keywords: *Viral Marketing, Informativeness, Entertainment, Source Credibility and Irritation.*

INTRODUCTION

Firms and marketers have used various type of marketing methods in order to increase their success in promoting and selling their products or services (Hill & O'Sullivan, 1999). By tradition, print advertisement and offline word-of-mouth were the marketing method that is frequently used by firms and marketers. However, as technology started to develop over the years, some other forms of marketing methods have been introduced. Internet have changed the way people communicate with each other by starting a new way of communicating which is through an online medium such as e-mail, direct message, blogs, and social media websites such as Facebook, Twitter, and Instagram (Ahlberg, 2018). This trend has eventually opened up the possibilities for people to communicate about things that are not entirely important, for instance, e-mailing chain, which is when an e-mail receiver is requested to send copies of the e-mail to people they know (VanArsdale, 1998). The reason for mentioning this is to show that this is how the internet works nowadays, especially on social media such as Facebook and Instagram, where everyone is doing the same thing.

Making things "go viral" or "going viral" is one of the phrases used for viral marketing, where it is currently one of the modern methods for promotion of products and services by firms and marketers (Zernigah & Sohail, 2012). The term viral marketing which also known as electronic word-of-mouth (eWOM) has turn out to be essential in the marketing trend for firms and marketers (Ferguson, 2008). This method has also the probable in reaching a much bigger audience than the traditional word-of-mouth. This is due to the reason that people are likely to have more 'friends' online, especially on their social network, than friends that they actually talk to in real life (Kaplan & Haenlein, 2011).

Previous researcher has stated that to promote any product or services efficiently, firms and marketers must first know their target audience (Ferguson, 2008). If firms and marketers have observed and found the active online customers, they need to take time and get to know their traits and habits by offering programs that allow them to engage further (Ferguson, 2008). In this research study, researcher is focusing on the 'internet' generation who are also known as Generation Y which is those who were born after 1981 (Zhang, Abound Omran, & Cobanoglu, 2017). Generation Y is one of the unique groups that have been participated by marketers and firms in order recognize their attitudes and behaviours (Zhang et al., 2017).

The problem with viral marketing is that, many firms and marketers can easily promote their product using viral marketing method, and if an inappropriate product are being promoted using this marketing method, a counter-productive effect might happen and resulting an unfavorable attitude towards those products (Leskovec, Adamic, & Huberman, 2005). The dangers that people may overlooked is that it might create negative word-of-mouth instead of positive word-of-mouth regarding the product and brand. Besides, a negative viral marketing seems to be spreading more easily and much faster than the positive ones (Kiss & Bicher, 2008). Besides that, the pictures and messages used in the viral marketing can be misunderstood by the users and receivers (Kirby & Marsden, 2006). This could result in a negative impact on the company's brand image and will lead to a loss of brand control (Woerdl et al., 2008).

This research study drives to investigate and understand the factor that influence the customer attitude towards viral marketing. This is to show whether the existence of factors affect positively or negatively towards the targeted customers and represent a beneficial opportunity to keep advertising research up to date with the new technology and the new online marketing platform. Currently, even though there is an increasing popularity for viral marketing, surprisingly, there are still very little research on it especially focusing on Generation Y attitudes towards viral marketing. Moreover, this study can provide significant information to the firms, and marketers to help them take advantage of the benefits of viral marketing (Petrescu, 2012). Thus, it is essential for the researcher to investigate the factor that influence Generation Y attitudes towards viral marketing.

LITERATURE REVIEW

Attitude Towards Viral Marketing

Attitude is an important concept in marketing when doing any kind of research. This is because, attitude play as an object in relation to customer orientation which is referred as marketing related concepts such as a product, product category, brand, service, and product use. In addition, it relates to the feelings, beliefs and the behavioural intentions of the customers towards the product or services (Wang et al., 2018). Attitude are learned through direct experience or through observation. As most firms and marketers have used the advantage of viral marketing to promote and advertise their product, customer whether satisfied or unsatisfied can also share their experience to many other people using social networks (Tomislav Sudarevic, Branislav Vlahovic, 2013). Customer's attitude towards advertising is one of the influential indicators of viral marketing campaign's effectiveness because the customer's cognitive ability towards the viral content are reflected in their thoughts and feelings and subsequently will influence their attitude towards the viral marketing campaign (Ling, Piew, & Chai, 2010). In order to further spread viral content, or to make a viral campaign successful, it must achieve a very positive effect.

Informativeness

Informativeness is defined numerous by previous researchers as the capability of firms and marketers in creating an advertisement and marketing content that can inform the targeted customers regarding their product or service to achieve the highest possible satisfaction (Ducoffe & Curlo, 2000). Similarly, (Oh & Xu, 2003) has defined informativeness as the ability of firms and marketers to successfully give the related information to the targeted customers. Furthermore, previous researcher has agreed that it is important for firms and marketers to provide a complete and comprehensive information to the targeted customers (Majedul Huq, 2015). This is because, the main goal in creating an advertisement for the viral marketing campaign is to inform the targeted audience about the firms and marketer's new products or new features of an existing products. This includes making the audience aware if there are any changes regarding the price of the products (Kotler & Keller, 2006). Moreover, if firms and marketers include the informativeness element in their advertisement for the viral marketing campaign, it will be able to change the customer's attitude, acknowledgement, and satisfaction as a reflection towards the resources given (Wang et al., 2018).

Entertainment

Viral marketing campaign that have the element of surprise, joy, and entertainment have a great significant influence on the customer's attitudes towards viral marketing (Wei, 2014). Entertainment is defined as something that people found to be entertaining, funny, exciting, eye-catching, and amusing (Tsang et al., 2004). There must be a reason for any person to take part in a viral marketing campaign willingly. There are many factors that can be the reason for a person to share the viral marketing content to their friends and family (Wijs, 2017). Entertainment may have been one of the factors for people to participate in the spread of viral marketing content. According to (Gangadharbatla & Lisa, 2007) firms and marketers that provides advertisement and websites that improve their visitors' sense of control, entertainment, interactivity, and brand experiences are most likely to attract positive customer's attitudes. This then results in an actual acceptance of the product and service by the targeted customers, that have been offered by firms and marketers through their campaign and sites (Zernigah & Sohail, 2012). Moreover, the entertainment element will eventually add value for the customers and increases the customer's loyalty for the product or service, thus, leading to a positive customer's attitude (Faraz Saadeghvaziri, 2001). The element of entertainment is seen to be capable of leading major impact on the customer's response towards viral marketing, therefore, it is important to include it in the advertisement for the viral marketing campaign.

Source Credibility

Source credibility is an important part in numerous marketing contexts and online environments (Jin, 2010). Source credibility can be relating to the trust of receiver of the information towards the source of it (Ohanian, 1990). Similarly, (MacKenzie & Lutz, 1989) defined it as customer's perception towards the honesty and reliability of the advertisement made by the firms and marketers. Basically, source credibility means how much does the receiver of advertisements trusted the sender, which reveals the mind-set of the receiver of the content to the sender. It also represents customer's attitude in relation to the source of the content (Esmaeilpour & Aram, 2016). According to previous studies, researchers have mention that source credibility as trustworthiness can also be link to perceived risk (Wang et al., 2018). This mean that, if it is confirmed that the content of the advertisement come from an actual trustworthy source, then the perceived risk related with the viral content is low (Zernigah & Sohail, 2012). Customers will tend to feel uncertain and have no privacy concerns when they receive the advertising content from their social network. This shows that the value of advertisement would impact on the receiver more strongly, if they have high credibility in the advertisement (Palka et al., 2009). Hence, the

FINDINGS

The study identified a relationship among the factors (informativeness, entertainment, source credibility, irritation) and attitude towards viral marketing. In achieving this, Pearson r correlation coefficients between each pair of variables were examined. As depicted in Table 1, informativeness ($r = 0.262$), entertainment ($r = 0.288$), source credibility ($r = 0.341$) at the 0.5 level of significance were positively but low relationship related attitude towards viral marketing. While irritation factor result showed ($r = -0.48$) with ($p = 0.600$) which is more than 0.05 indicates that there was no significance, but the R-value showed moderate relationship. Researcher from previous study have also conclude that irritation does not have any significant impact on the dependent variable of attitude towards viral marketing (Zernigah & Sohail, 2012). The findings from this research study point out that most of Generation Y does not have positive attitude towards viral marketing. This is shown through the result where the independent variable of informativeness, entertainment, and irritation does not significantly affect the dependent variable of attitude towards viral marketing.

Table 1: Pearson Correlation Coefficient between Informativeness, Entertainment, Source Credibility, Irritation with Attitude towards Viral Marketing

Variables	r-value	Result
Informativeness	0.262	Low Relationship
Entertainment	0.288	Low Relationship
Source Credibility	0.341	Low Relationship
Irritation	-0.48	Moderate Relationship

In relation to the question of what the best predictor for explaining attitude towards viral marketing, a multiple regressions analysis was conducted. Table 2 shows the results of regression analysis of the four independent variables which is informativeness, entertainment, source credibility, and irritation regressed against dependent variable which is attitude towards viral marketing. Based on the table, the value for informativeness is ($\beta = 0.077$) with ($p = 0.489$) which is more than 0.05. Thus, it indicates that there is no significant relationship between informativeness and attitude towards viral marketing. The value for entertainment is ($\beta = 0.129$) with ($p = 0.238$) which is more than 0.05 indicates that there is no significant relationship between entertainment and attitude towards viral marketing. Next, the value for source credibility is ($\beta = 0.235$) with ($p = 0.029$) which is less than 0.05. Therefore, it indicates that there is a significant relationship between source credibility and attitude towards viral marketing. Lastly, the value for irritation is ($\beta = -0.044$) with ($p = 0.620$) which is more than 0.05. Thus, it indicates that, there is no significant relationship between irritation and attitude towards viral marketing.

Table 2: Regression Analysis Summary for Attitude Towards Viral Marketing

Variables	Standardized Coefficient (β)	Sig.	R ²
(Constant)		0.002	0.140
Informativeness	0.077	0.489	
Entertainment	0.129	0.238	
Source Credibility	0.235	0.029	
Irritation	-0.044	0.620	

higher the source credibility of the marketing tools, the higher is the impact on customers' attitude (Haghirian et al., 2005).

Irritation

Irritation in the context of viral marketing campaign is referred to as when firms and marketers use tactics or strategies that can annoy, offend, insult or overly manipulate customers through their advertising content (Ducoffe, 1996). Additionally, the feeling of having your intelligence belittled, getting annoying messages and irritating provocations are the elements of irritation (Brackett & Carr, 2001). As the advertising content provided in the marketing campaign may have a numerous range of information in it, it may easily confuse, distract and overload the receivers with too much information. Thus, resulting in a negative reaction by customers towards the advertising in the viral marketing campaign (Zernigah & Sohail, 2012). There are still many customers that are not quite comfortable and sure with the concept and idea of viral marketing due to the reason that the customers still feel uncertain and unsure whether the advertisement content that have been upload by the creator are trustable and reliable (Siau & Shen, 2003). Thus, by using irritation as a technique in the viral marketing campaign will only worsen the scenario and making customers act and behave negatively towards viral marketing campaign. Firms and marketers can reduce irritation by delivering an appropriate advertisement content that can provide relevant value to the targeted audience (Haghirian et al., 2005). In addition, irritation that were caused from any form of viral marketing campaign such as through SMS, video, e-mail, or blog, can be lessen if firms and marketers use the permission-based marketing concept (Zernigah & Sohail, 2012). For example, in the situation of SMS advertising, there should be an in advance notification sent to the customer asking permission whether they could send their advertisement to the customer through SMS. This is where the customer can either accept or decline on receiving the overflowing advertisement in the form of SMS from the firms and marketers (Salem, 2016).

RESEARCH METHODOLOGY

The data were collected from the sample using the validated and reliable research instrument. After the data were collected, they were analyzed using correlation and multiple regression analysis. Correlation analysis was used to determine the relationship between the independent and dependent variables, while multiple linear regression analysis was used to determine the contributions of each of the significant predictors or independent variables towards the variance in the criterion or dependent variable. The target populations of this study are the Generation Y around Johor. According to (Malhotra & Birks, 2003), lesser group of population has the capability to make the reasoning or proof that will represent a bigger group of population to draft a sample. From this statement, 120 respondents have been chosen to represent the total population of Generation Y. For this study, the sampling method that will be use by researcher is convenience sampling under non-probability technique. The research instrument that will be use in this study is questionnaire. The questionnaire that is used in this research study will be classified into two section and other several parts.

First, Section A contain the demographic background of the respondents. It consists of gender, race, age, marital status, and occupation of the respondents. Next, Section B is aimed to examine and evaluate the dependent variable and independent variable. The sources of the constructed instrument used on this research study were adopted from (Zernigah & Sohail, 2012). The data were analyzed using the SPSS reliability and, the Cronbach's Alpha coefficient of reliability was derived. The reliability index Cronbach's Alpha of the instrument for attitude towards viral marketing was 0.717 while for independent variables which consist of informativeness (0.771), entertainment (0.716), source credibility (0.787) and irritation (0.791).

As shown in Table 2, R^2 is only equal to 14.0% which informed that 14.0% of R^2 is influenced by the informativeness, entertainment, source credibility and irritation. Therefore, another balance of 86.0% is left to be explained by another factors. To conclude, source credibility is the most significant predictor variable that affected attitude towards viral marketing with the value of Beta Coefficient (0.235) or 23.5% and significant at 0.029. The only independent variable that shows a positive outcome in this research study is, source credibility. Source credibility plays as the significant predictor in this research study as the results shows that the Generation Y respondents tend to only believe and trust advertising content that they received from reliable and trusted sources. This study findings are seen to be similar to the findings of previous study (Zernigah & Sohail, 2012) as their research outcomes also showed a positive effect of source credibility on attitude towards viral marketing.

CONCLUSION

Throughout this research study, it was found that there is a similar and differences in the results between the present study and the past one. The different outcomes can be resulted from so many reasons. One of the most obvious reasons is the different culture in the country that the research study took place. For instance, the current research study targeted on the people in Johor, Malaysia, while previous study was conducted in Pakistan (Zernigah & Sohail, 2012). It shows that, the different culture in the country might cause dissimilar way of thinking and actions of the targeted respondents. Besides, viral marketing is a marketing method that has not been entirely explored and still new for the people in Malaysia, thus, it is probably unfamiliar for the respondent to answer the question provided in the questionnaire.

A successful viral marketing will influence the growth of firms and marketers especially in terms of sales and brand recognition. Hence, for the firms and marketers, knowing their targeted customer's attitude and behaviour is an important part to make the viral marketing campaign a success. The results of this research illustrate that, having a high source credibility is an important factor for a viral marketing campaign to gain positive feedback. Therefore, it is suggested to the firms and marketers to create and distribute all their viral marketing messages and content in a more credible source. This includes, providing an informative, enjoyable, realistic, and not to forget truthful contents to the targeted customers. Additionally, adding a permission-based marketing concept in the viral marketing campaign may also lead to a more positive attitude towards viral marketing. Firms and marketers need to build up their credibility which means, they need to make an advertisement or viral marketing campaign that are convincing to its targeted customers or audience. Being honest in the process of making it is very important to achieve credibility (Le & Nguyen, 2014).

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