Technological Innovation and the Adoption of Internet Financial and Sustainability Reporting

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ABSTRACT

The purpose of this study is to examine the internet financial and sustainability reporting adoption of Top 100 Public Listed Companies on Bursa Malaysia with the integration of Diffusion of Innovation (DOI) theory and Technology-Organizational-Environment (TOE) framework. The sample of this study consists of 76 Public Listed Companies from the population of Top 100 Public Listed Companies in Bursa Malaysia. This study used internet financial and sustainability reporting index to measure the adoption level and the technological context, organizational context and environmental context as independent variables. The data of this study is focused on the quantitative method with secondary data. The data is being collected from the annual report in the year 2018. The results indicate that only organizational context positively significant with internet financial and sustainability reporting adoption while, technological context and environment context do not have any impact on the internet financial and sustainability reporting adoption. The suggestion for this study is the company should adopt internet financial and sustainability reporting in order to communicate with their stakeholders in a timely manner and increase the confidence level of investors.

Keywords: DOI Theory, Internet Financial and Sustainability Reporting, TOE Framework.

1. INTRODUCTION

Studies on the application of the Internet as a means of disclosure financial and sustainability data online has increased widely (Keliwon, Shukor, and Hassan, 2018; Omran and Ramdhony, 2016; Ribeiro, Monteiro, and Moura, 2016). The Internet served as another communication media platform for the disclosure of information among the companies to their stakeholders all over the world during the 1990s (Alarussi and Shamkhi, 2016; Dolinšek and Lutar-Skerbinjek, 2018; Halim, Basiruddin, and Ali, 2015; Khan and Ismail, 2011). The internet is an effective communication platform for companies to disclose financial and non-financial information (Dâmaso and Lourenço, 2011; Ilias, Razak, and Rahman, 2015). The growing number of websites indicate how well the internet technology is being used to a greater level (Keliwon and Aziz, 2005; Khan and Ismail, 2011). The internet had been changed the way individuals and companies to access and share information (Omran and Ramdhony, 2016).

Malaysia can be considered as a developing country, which has an emerging market economy. All of the Public Listed Companies in Bursa Malaysia voluntary disclose their financial information in accordance with Malaysian Financial Reporting Standards (MFRS) (Ilias *et al.,* 2015) and need to disclose their sustainability practices which focus on four focal areas namely environment, workplace, marketplace and community. Sustainability reporting disclosure demonstrates the ability of companies to commit in a sustainable manner whilst balancing the interest of various stakeholders (Aziz and Bidin, 2017). Bursa Malaysia also can be known as the first emerging

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capital market that issued guidelines on internet financial and sustainability reporting in the year of 2009 (Keliwon, Shukor, and Hassan, 2018). All of the listed companies have to disclose internet financial and sustainability and sustainability information as listing requirements by Bursa Malaysia. Those companies with a large number of shareholders are more likely to use the internet as a medium to communicate their financial (Halim, Basiruddin, and Ali, 2015) and sustainability information (Aziz and Bidin, 2017). Disclosure financial and sustainability information online helps large companies to reach national investors as well as international investors (Aly, Simon and Hussainey, 2010).

However, the level of internet financial and sustainability reporting of Public Listed Companies on Bursa Malaysia are not fully disclosed yet. In the analysis of Malaysian PLC, there are only 59% of the total listed companies have websites, which is 505 out of 849 total listed companies in Bursa Malaysia (Alarussi and Shamkhi, 2016). The recent previous study on internet financial reporting done in Malaysia also shown that different economic sectors have different scores for internet financial disclosure index (Turmin *et al.,* 2016). The finance industry tends to have the highest level of internet financial reporting compared with other industries. The high level of internet financial reporting can help finance companies to attract investment and raise capital. However, the consumer product industry has the lowest level of internet financial reporting. None of the sample industries has fully disclosed their financial information online in previous findings (Turmin *et al.,* 2016). Based on the previous study done by Kamalluarifin (2016), the findings of the study showed that there are none of the checklist items on corporate financial reporting index had a full score of 100%. There are only 60% to 63% of the Malaysian Listed Companies that disclose some financial information on websites (Alarussi and Shamkhi, 2016). The overall internet financial reporting level from all of the Public Listed Companies on Bursa Malaysia had scored 65.10% of disclosure index (Khan and Ismail, 2011). In the same trend, Amran (2012) indicate that the practice of online sustainability reporting in Malaysia is still low. However, companies belonging to the sensitive industry tend to disclose more. Those previous findings showed a significant deficiency of Malaysia's Public Listed Companies on internet financial and sustainability reporting.

According to Almilia (2015), the high level of online financial and sustainability disclosure will increase the transparency and accountability of a company, thus minimise asymmetric information problems and production costs. The internet financial reporting also helps users to make the rational decision-making process by easy access to the financial information, especially decisions of investors on their investment (Kamalluarifin, 2016; Andrea Seaton Kelton and Pennington, 2012; Khan, Ismail, and Zakuan, 2013). Therefore, it is important to study the factors that contributed to the adoption of internet financial and sustainability reporting (AIFSR) among the Public Listed Companies. Previous studies have been conducted empirically to evaluate the company attributes on online financial and sustainability reporting such as firm size, profitability, leverage, liquidity, board size and managerial ownership (Dolinšek and Lutar-Skerbinjek, 2018; Omran and Ramdhony, 2016; Pervan and Bartulović, 2017; Amran, 2012) as factors that contributed to the AIFSR. Numerous studies also relate agency theory and apply corporate governance mechanism as factors that contribute to the AIFSR (Dolinšek and Lutar-Skerbinjek, 2018; Kamalluarifin, 2016; Lihniash, Egdair, and Ahmed, 2019). However, there is a lack of studies on technology innovation influences on the adoption of internet financial and sustainability reporting.

The development of the Internet as a type of technological innovation had changed the business reporting environment (Al-Hajaya and Sawan, 2018). Online financial reporting is a type of Internet-based innovation. The development of the Internet changes the ways of a company's financial reporting. Internet financial and sustainability reporting is needed to be adopted by companies in the Internet-based technology environment.

In the context of Technology-Organizational-Environment (TOE) model, Hue (2019) explained that there are three factors that contribute to new innovation adoption, which are technological, organizational and environmental. In the technological context, internal and external technologies are expected to influence the adoption of innovative activities by a company. The organizational context refers to characteristics of a company, resources, internal social network and organizational culture on adoption behaviour (Jia, Guo, and Barnes, 2017). Moreover, environment context of a company emphasized on the external surrounding of business operation (Mohamed, Omar, Daud, and Marthandan, 2009) such as the structure of the industry, competitors, macroeconomic context and government regulation environment (Bagale, 2014). Hence, it is crucial to address the question of whether the TOE model has a significant effect on AIFSR.

This study fills the above gaps by integrating the Diffusion of Innovation (DOI) theory and TOE model as a new method in explaining the adoption of Internet financial and sustainability reporting in Malaysia. This study aims to analyse the effects of technological, organizational and environmental context on the adoption of internet financial and sustainability reporting. However, there has been little discussion about the adoption of internet financial and sustainability reporting with DOI theory and TOE model. Therefore, the empirical results may help future researchers gain a better understanding towards the factors on internet financial and sustainability reporting adoption. In the contribution on practical aspects, the public listed companies can gain additional insight into the advantages of enhancing the level of internet financial and sustainability reporting through this study. Besides, this study also can serve as a guidance for Bursa Malaysia to increase disclosure transparency on internet financial and sustainability reporting by all Public Listed Companies. Lastly, this study also can provide additional knowledge for future researchers on topics of internet financial and sustainability reporting adoption in technological innovation context.

The remainder of the paper is organised as follow: section two reviews the literature, section three explaining on methodologies, section four analyse the empirical results, and the final section concludes the paper.

2. LITERATURE REVIEW

In the new global economy, Internet financial and sustainability reporting has become a central issue for Public Listed Companies, which is a recent, fast-growing phenomenon and is developing rapidly. The emergence of the World Wide Web (Web) has resulted in companies to restructure their disclosure policies as the Web brings much more flexibility in presentation and reporting material than the traditional reporting method (Cormier, Ledoux, and Magnan, 2009). Companies are willing to invest in their web presence development to increase the motivation of using a web site as a communication channel with disclosing more information (Fuertes-Callén, Cuellar-Fernández, and Pelayo-Velázquez, 2014).

There are previous studies of internet financial and sustainability reporting adoption have been conducted in different countries such as United Kingdom (Dâmaso and Lourenço, 2011), Sri Lanka (Kuruppu, Oyelere, and Al-Jabri, 2015), United States (Hindi and Rich, 2010), Egypt (Aly, Simon, and Hussainey, 2010), Canada (Cormier *et al.,* 2009), Indonesia (Jaya and Verawaty, 2015), Malaysia (Homayoun and Rahman, 2010). Some of the previous researchers conduct cross-country analysis on the level of internet financial and sustainability reporting. The comparative studies on different countries had been investigated such as Indonesia, Malaysia, Singapore, Japan and Australia (Almilia, 2015), Morocco and Tunisia (Henchiri, 2011), Argentina, Chile and Mexico (Fuertes-Callén *et al.,* 2014).

There are various sectors involved in the studies of internet financial and sustainability reporting adoption such as level of internet financial and sustainability disclosure by listed companies (Aly *et al.,* 2010; Homayoun, Rahman, and Bashiri, 2011) and the adoption of internet financial and sustainability reporting by the government sector (García and García-García, 2010). With the adoption of internet financial and sustainability reporting, the company can distribute its financial report online. Hence, internet financial and sustainability reporting helps to minimize the cost (Dolinšek and Lutar-Skerbinjek, 2018) and increase sustainability performance (Amran, 2012). The adoption of internet financial and sustainability reporting will also help the company to communicate with stakeholders in time (Ojah and Mokoaleli-Mokoteli, 2012). The information of a company can reach all the stakeholders faster and up-to-date. The stakeholders of the company are able to access to financial information of the company at anytime and anywhere (Aziz *et al.,* 2011). Internet financial and sustainability reporting bring convenient approach for the foreign investors easy reach to the company's information (Turmin *et al.,* 2016). The information of a company can be presented in a flexible way through internet financial and sustainability reporting. The financial information of a company can be presented in graphic, video and portable document format (pdf) (Salehi, Moradi, and Pour, 2010). Internet financial and sustainability reporting provides interactive communication between company and stakeholders (Halim *et al.,* 2015). Besides, internet financial and sustainability reporting helps the company to gain a high degree of transparency in business operation (Almilia, 2015). The high degree of transparency disclosure of a company will help improve the company's image and reputation (Kiew-Heong and Saleh, 2011). A company with a good reputation will attract investors to invest and raise capital (Yassin, 2017). The company's online financial information disclosure may help investors to make rational decision-making process (Khan and Ismail, 2012).

In order to examine the level of internet financial reporting, a method of disclosure index had been applied by previous researchers. The number of items was investigated based on the content dimension and presentation dimension of internet disclosure. In the study of Sia et al. (2018), a content analysis approach had been used to measure the internet financial reporting and the index consists of 36 items: 12 items on disclosure format and 24 items of content disclosure. Moreover, another internet financial disclosure index with a total of 50 items was constructed by Al-Arussi et al. (2009), where 36 items are on internet environment disclosure and 24 items on internet financial disclosure. Another internet financial reporting index was focusing more on technology support rather than content dimension (Almilia, 2015). The internet financial reporting index was divided into four parts and assigned with weight, which is content (40%), timeliness (20%), technology (20%) and user support (20%). One of the previous studies determines the level of internet financial reporting based on the characteristics of internet financial reporting (Salehi *et al.,* 2010). The checklists of characteristics of internet financial reporting were divided into six sections, which are general attributes, corporations overview, accounting and financial information, corporate governance information, timeliness of information and contact details. Some of the previous studies include other attributes of internet financial reporting into checklist such as investor relation section and forward-looking section (Turmin *et al.,* 2016), social responsibility section and general assembly section (Uyar, 2012).

The previous studies on primary data methods were employed as another instrumentation to examine the perception of the level of internet financial reporting such as a questionnaire. The instruments on the questionnaire were rated by a five-point Likert scale or seven-point Likert scale. The different aspects of internet financial reporting have been studied by using questionnaires such as users' opinion about internet financial reporting (Khan and Ismail, 2011b), issues on internet financial reporting (Beattie and Pratt, 2003), intention to use internet financial reporting (Ilias *et al.,* 2014), benefits of internet financial reporting (Khan *et al.,* 2013) and behaviour on internet financial reporting (Lee, Chung, and Kang, 2008)

Furthermore, various determinants that influence the AIFSR have been investigated by previous researchers. The determinants can be classified as internal and external factors of a company. The

internal factors include the company's characteristics, corporate governance and management support. Meanwhile, firm size, leverage, profitability and auditor size and board size were being identified as internal determinants of internet financial and sustainability reporting (Omran and Ramdhony, 2016). However, AIFSR also can be influenced by external factors. The external factors are about environmental determinants of a company such as the industrial sector, government regulation and foreign listing status. Based on the previous studies, the different external factors have been used to explain the level of internet financial and sustainability reporting (Aly *et al.,* 2010; Ojah and Mokoaleli-Mokoteli, 2012). Hence, the adoption of new technology innovation such as internet financial and sustainability reporting can be explained by both internet and external factors of a company.

2.1 Technology innovation on Internet financial and sustainability Reporting Adoption

Technology-Organizational-Environment (TOE) framework was developed by Tornatzky and Fleischer (1990). This framework was used to examine three groups of organizational factors in the adoption of technological innovation, which are technological context, organizational context and environmental context. The technological context includes both internal and external technologies that relate to the company. The organizational context refers to the internal company's issues such as characteristics and resources of the company that influences to adopt technological innovation. The characteristics of the company may refer to firm size, human resource, organizational structure, profitability and ownership. Besides, the environmental context includes the structure of the industry, competitors, government regulations and other external environment resources. These three contexts will bring an impact on how a company adopts and implements technological innovations (Ismail and Mokhtar, 2016).

The innovation adoption in the technological context is introducing the new features or new versions of existing technologies (Dwivedi, Schneberger, and Wade, 2012). The technological innovation helps the company to gain competitive advantages and enhance competitive standing. The changes in existing technology can influence the decision to adopt new technology based on several aspects such as relative advantages, complexity and compatibility. Besides, organizational context can promote the adoption of innovative technology (Dwivedi *et al.,* 2012). For example, top management can encourage employees to involve in innovation adoption and foster innovation adoption behaviour in an organization. Next, the environmental context represents external organizational influences such as industry structure, government regulation and market structure (Dwivedi *et al.,* 2012). For example, the new government regulations can enforce company to comply and adopt new technology. Therefore, technological, organizational and environmental context can be explained as determinants in affecting the adoption of innovative technology.

Several studies explained the various types of technological innovations such as eXtensible business reporting language adoption (Rostami and Nayeri, 2015), enterprise resource planning (ERP) solution adoption (Awa, Ukoha, and Emecheta, 2016), enterprise post 2.0 adoption (Jia *et al.,* 2017) and broadband mobile application adoption (Chiu, Chen, and Chen, 2017). From the literature review, however, there is a lack number of studies on internet financial and sustainability reporting based on the TOE framework. Thus, the TOE framework is believed can help to explain the AIFSR in a comprehensive approach.

This study used the Diffusion of Innovation (DOI) theory as an underlying theory to explain all relationships in this study. DOI theory can be known as a theory used to explain factors to adopt a new innovation technology (Al-Jabri and Sohail, 2012). This theory explains the how, why and at what rate new ideas and technology spread (Rogers, 1995). Diffusion defined as a process of innovation had been communicated through certain channels over time of a social system. In other words, that is an impact on diffusion processes which is the acceptance or penetration of new innovation. There are four main elements in the DOI, which are innovation, communication

channels, time and social system. This theory was being applied to technological innovation (Rogers, 1995).

According to Rogers (1995), innovation is any new idea, object or process that was interpreted by an individual or another unit of adoption. There were five stages of the innovation adoption process, which are (1) Knowledge, (2) Persuasion, (3) Decision, (4) Implementation, (5) Confirmation (Rogers, 1995). Knowledge can be defined as an individual lack information about innovation at the first perception and low interest to know more about innovation. In the Persuasion stage, the individual started to search for more related information and increase the level of interest in the innovation. Next, the Decision stage is about an individual takes the concept of evolution and identify the advantages and disadvantages of the innovation change. Then, the individual will decide whether to adopt or reject the innovation. During the Implementation stage, the individual will adopt the innovation to a certain level depending on the situation. The individual will evaluate the usefulness of the innovation and seeks more information. At the last stage, the individual will evaluate his or her decision to continue innovation practices. Both intrapersonal and interpersonal determinants are needed to make the confirmation on the right decision.

There were several characteristics of innovations that been identified by Rogers (1995), which are relative advantage, complexity, compatibility, trialability and observability. The different characteristics of innovations can cause a different rate of adoption. Relative advantage refers to the degree that innovation can bring more advantages than the previous idea, product or process. The individual will adopt an innovation if the innovation has done better than previous practices. The degree of relative advantage can be measured by social-prestige factors, convenience, satisfaction and economic factors (Rogers, 1995). The complexity is the difficulty to understand and to adopt the innovation. The high level of difficulty of innovation is, the longer the time for an individual to adopt. Next, compatibility is the degree of innovation is consistent with the existing values, past experiences, beliefs and needs of an individual. Individuals will tend to adopt an innovation if the innovation is compatible with living experiences. Besides, trialability refers to the opportunity for an individual to test on the innovation before full adoption. The adoption of innovation will be implemented if the individual had hands-on experience before. Lastly, observability can be described as the results of innovation that can be visualized and noticeable by everyone. If the changes in innovation can be observed, the more likelihood of innovation adoption by an individual.

The DOI theory had been applied in few numbers of studies to examine the factors that influence Internet-based innovation adoption. For examples, mobile banking adoption (Al-Jabri and Sohail, 2012), broadband mobile application adoption (Chiu *et al.,* 2017), e-health innovation adoption (Zhang *et al.,* 2015), enterprise resource planning systems (Akca and Ozer, 2014), Internet TV adoption (Latiff *et al.,* 2017), and online financial transaction adoption (Syahadiyanti and Subriadi, 2018).

Online financial reporting is a type of Internet-based innovation. The development of the Internet changes the ways of the company's financial reporting. Internet financial reporting can help the company to communicate with its stakeholders in an accurate and timely manner. Internet financial reporting also can minimize costs by reducing printed reports. Internet financial reporting is needed to be adopted by the company in the Internet-based technology environment. Hence, it is important to explain the AIFR with the DOI theory.

2.2 Technological Context

All of the existing and new technologies in a company are known as technological context. In order to adopt new technology, the company needs to consider the existing level of technology (Bagale, 2014). In the previous study on extensible business reporting language (XBRL) adoption

(Rostami and Nayeri, 2015), three factors are being examined under technology aspect, which are easy understanding of system, compliance of innovation and successful implementation of innovation. Hue (2019) considers technological intensity as a factor that influences innovation decisions. The finding reveals that the higher the level of technological intensity, the more interest of a company to make innovation decisions. Technological factors have the highest significant value in the study of enterprise resource planning (ERP) solution adoption (Awa, Ukoha, and Emecheta, 2016).

Based on Diffusion of Innovation (DOI) Theory, innovation adoption can be influenced by several types of characteristics such as relative advantage, complexity and compatibility (Rogers, 2003). Relative advantage is described as the benefits of a new innovation compared to existing technologies. The relative advantage has shown a significant relationship on the adoption of Internet-based innovation (Al-Jabri and Sohail, 2012). Besides, complexity refers to the difficulty level of understanding and adopting innovative technology. The level of complexity innovation technology has a significant impact on adoption (Latiff *et al.,* 2017). The high complexity level tends to decrease the opportunity for a company to adopt innovative technology. Lastly, compatibility is how the innovation technology corresponds with past experience, values and needs of the adopter. If innovation technology is not compatible with the adopter, the adopter might refuse to adopt the new technology. Incompatibility decreases the percentage of new innovative technology adoption (Zhang, Yu, Yan, and Spil, 2015). Thus, based on the literature review on technological context, the adoption of innovation technology can be influenced by relative advantage, complexity and compatibility. The first hypothesis is developed as follows:

H1: Technological context has a positive relationship with AIFSR.

2.3 Organizational Context

The organizational context is about the attributes of a company such as the internal characteristics (Chiu, Chen, and Chen, 2017). For example, firm size, managerial ownership, human resource and profitability are the factors under organizational context. The internal characteristics of a company can influence on the innovation adoption. Based on the previous study, firm size and managerial beliefs have the strongest influence on web technology investment (Mohamed, Omar, Daud, and Marthandan, 2009). Top management support, organizational readiness, information intensity and product characteristics and managerial time are being employed by a previous researcher to evaluate the information system adoption (Hoti, 2015). The result showed that the characteristics of a company significantly impact on innovation system adoption.

Based on the organizational context, corporate governance mechanisms may influence innovation adoption. Corporate governance mechanisms used to monitor and determine the information disclosure policy of a company (Kelton and Yang, 2008). Different corporate governance mechanisms tend to have different levels of innovation technology adoption (Kamalluarifin, 2016; Kelton and Yang, 2008). Hence, a company board's practices can affect the adoption of innovation technology. Based on these arguments, hypothesis 3 is developed as follows:

H2: Organizational context has a positive relationship with AIFSR.

2.4 Environmental Context

The environment can be described as an arena in which a company conducts its business such as industry sector, pressure from competitors, government regulation and pressure from business partners (Bagale, 2014). The external issues of a company may affect the decision on innovation adoption. The environment factor brings major impact on XBRL adoption, which is environmental

pressure from regulatory agencies and competitive pressure from peer company (Rostami and Nayeri, 2015). Export activities of a company also have been considered as one of the environment factors (Hue, 2019).

Different industry sectors may have different practices on innovation adoption. The industry types have a significant impact on innovation adoption (Dolinšek and Lutar-Skerbinjek, 2018). Based on the previous study, the technological-based company is more likely to adopt innovation technology (Hue, 2019). The manufacturing industry is more likely to adopt innovation technology compare to the service industry (Chong, Ali, and Lodhia, 2016). Therefore, it is a high possibility that the adoption of innovation technology can be influenced by different types of industrial sectors. Thus, hypothesis 3 is as follows:

H3: Environmental context has a positive relationship with AIFSR.

3. METHODOLOGIES

3.1 Methods of Data Collection

The secondary data is collected in this study using quantitative method analysis. The data of this study is extracted from the annual report and companies' websites. This study focuses on Top 100 of PLC from Bursa Malaysia according to their market capitalization. The Top 100 of PLC are chosen because of their completeness of data available. From the Top 100 of PLC, finance companies are being excluded because of different business environment and regulation. Therefore, only 76 of PLC are being investigated in this study. Besides, this study is only focused on the annual report in the year of 2018. The year 2018 was chosen because it was up-to-date information available at this study conducted time.

3.2 Measures of Variables

In terms of the TOE framework, the data for each of the contexts are being collected from each of the company's annual report, which is reported in the year of 2018. All of the annual reports are downloaded from Bursa Malaysia and companies' website. Meanwhile, the AIFSR was identified based on the internet financial and sustainability reporting index. The internet financial and sustainability reporting index is adopted from Dâmaso and Lourenço (2011) because of easy understanding and analyzing.

The internet financial and sustainability reporting index focus on characteristics of internet financial and sustainability reporting from each of the companies. The characteristics of internet financial and sustainability reporting were classified into four groups such as information on the first page of website, investor relations on the website, annual report on the website and other information on the website. Besides, scores are given to each of the characteristics respectively, as shown in Table 1.

Table 1 Internet financial and sustainability Reporting Index

First Page	
Link to "Investor Relations" or "Investor" or "Shareholder information" in the 1st page	1 if there is a link to "Investor Relations" or "Shareholder information" in the 1st page "Investor" or "Shareholder information" in the 1st page, and 0 otherwise
Latest News in the 1st page	1 if there is Latest News in the 1st page, and 0 otherwise

Total of IFR - 1ª page (IFR-1P)	The sum of scores of the above 2 characteristics
Investor Relation (Contacts, E-mail alert and FAQ)	
Investor relations Contacts	1 if there is an investor relations contacts, and 0 otherwise
Investor E-mail alert (news)	1 if is possible to subscribe an Investor e-mail alert, and 0 otherwise
Total of IFR – Investor relations (IFR-IR)	The sum of scores of the above 3 characteristics
Annual Report	
Download the annual report of the year	1 if is possible to download the annual report of the year, and 0 otherwise
Download the annual report of the last 3 years	1 if is possible to download the annual report of the last 3 years, and 0 otherwise
Download the financial statement separately in PDF format	1 if is possible to download the financial statement separately in PDF format, and 0 otherwise
Download the financial statement separately in Excel format	1 if is possible to download the financial statement separately in Excel format, and 0 otherwise
Download the Sustainability reporting separately in PDF format	1 if is possible to download the sustainability reporting separately in PDF format, and 0 otherwise
Total of IFR – Annual report (IFR-AR)	The sum of scores of the above 5 characteristics
Other Information	
Financial Calendar	1 if there is a financial calendar available, and 0 otherwise
Share price information	1 if there is a share price information available, and 0 otherwise
5 Year Summary (Financial ratios, key statistics, or other information presented apart from the annual report)	1 if there is a 5-year summary, and 0 otherwise
Total of IFR – Other information (IFR-OI)	The sum of scores of the above 3 characteristics
IFR	IFR-1P + IFR-IR + IFR-AR + IFR-OI

Sources from (Dâmaso and Lourenço, 2011)

Next, the technological context was measured by company age, the number of subsidiaries and total assets in place. The company's age represents the relative advantage of the company. Besides that, the number of subsidiaries is representing the complexity of a company. In terms of compatibility of a company, it was represented by total assets in place. The frequency of board meetings was used to measure the organizational context and industry types are identified in the environmental context. The independent variables and the corresponding measurement were summarized in Table 2.

Table 2 Measurement for Independent Variables

Variable	Code	Dimension	Measurement	Sources
Technological context	TECH	Company age	Number of years since the foundation	(Hossain *et al.,* 2012)
		Company subsidiaries	Total number of company subsidiaries	
		Asset in place	Fixed assets/Total assets	
Organizational context	ORG	Board meeting	Frequency of board meeting	(Hashim *et al.,* 2014)
Environmental context	ENV	Industry types	Industry code from 1 to 12 according to industry classification group	Developed for the research

The control variables in this study are firm size, leverage and return on equity. The measurement of firm size is the natural log of total assets. This measurement is similar to the previous study (Homayoun and Rahman, 2010). Next, the leverage of each sample company is measured with total debt to total asset ratio. The same measurement on leverage also been applied in the previous study (Aly *et al.,* 2010).

The regression model was developed to justify the association between independent variables and dependent variable in the form of internet financial and sustainability reporting index. Hence, the equation was shown below as:

$$AIFSR_i = \beta AIFSR_i = \beta 0 + \beta_1 TECH_i + \beta_2 ORG_i + \beta_3 ENV_i + \beta_4 FRMSIZE_i + \beta_5 LEV_i + \beta_6 ROE_i + \varepsilon i \qquad (1)$$

Where:

AIFSR = the total amount of internet financial and sustainability reporting index
TECH = technological context
ORG = organizational context
ENV = environmental context
FRMSIZE = firm size
LEV = leverage
ROE = return on equity
ε = error terms
i = list of the companies

3.3 Results of the study

This study used Statistical Packages for Social Science (SPSS) software program to run the analysis. The descriptive analysis is used to provide a summary of the basic data of samples. Meanwhile, multiple regression analysis is used to test the hypotheses. The analysis has started with Collinearity diagnostic test. The results show that there is no multicollinearity problem between the variables. The range of VIF values of each variable is less than 10 which is from 1.088 to 2.100. Table 3 shows the results.

Table 3 Collinearity Diagnostics

Variables	Collinearity Statistics	
	Tolerance	VIF
TECH	.722	1.386
ORG	.730	1.371
ENV	.871	1.148
FSIZE	.476	2.100
ROE	.640	1.562
LEV	.919	1.088

Notes: Dependent Variable: AIFSR. TECH=technological context. ORG=organizational context. ENV=environmental context. FSIZE=firm size. ROE=return on equity. LEV=leverage. VIF=variance inflation factor.

Next, the Kolmogorov-Smirnov and Shapiro-Wilk tests are used to evaluate the normal distribution of each variable in this study. Based on Table 4, only firm size and leverage variables are normally distributed with a significant value of more than 0.05 while other variables are not normally distributed because they found to be significant in the K-S test. The reason for variables is not normally distributed may be due to the sample size in this study.

Table 4 Normality Test

Variables	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
AIFR	.176	76	.000	.938	76	.001
TECH	.133	76	.002	.879	76	.000
ORG	.215	76	.000	.772	76	.000
ENV	.178	76	.000	.875	76	.000
FSIZE	.097	76	.074	.983	76	.407
ROE	.197	76	.000	.815	76	.000
LEV	.061	76	.200*	.991	76	.872

Notes: AIFR=adoption of internet financial reporting. TECH=technological context. ORG=organizational context. ENV=environmental context. FSIZE=firm size. ROE=return on equity. LEV=leverage.*. This is a lower bound of the true significance.

3.4 Descriptive Analysis

There are 11 types of industry sectors involved in this study. The frequency of each industry sector was summarized in Table 5.

Table 5 Frequency Table of Industry Sector

Industry Sector	Frequency
Consumer Products & Services	20
Telecommunication & Media	6
Plantation	7
Industrial & Computer Products & Services	10
Construction	3
Energy	5

Health Care	5
Property	6
Technology	3
Transportation & Logistics	5
Utilities	6
Total	76

Table 6 shows the descriptive statistics of each variable. Based on the scoring value for AIFSR, the maximum value is 11 and the minimum value is 1. The mean score for AIFSR is 7.79. Besides, the maximum score for technology is 51.21 and the minimum score is 1.12 with an average score of 14.9761. Regarding of organization, the maximum value is 21 and the minimum value is 4 with a mean value of 5.24. For the firm size, it is measured by the natural log of the total assets of a company. The maximum log value of firm size is 11.1867 and the minimum value is 8.6072 with a mean value of 9.921628. Based on the return on equity (ROE), the average value is 0.5566 with a maximum value of 3.2818 and minimum value -0.3886. Lastly, the maximum ratio of leverage is 0.9046 and the minimum ratio 0.0649 with a mean ratio of 0.4769.

Table 6 Descriptive Statistics

Descriptive Statistics				
	Minimum	Maximum	Mean	Std. Deviation
AIFR	1	11	7.79	1.893
TECH	1.12	51.21	14.9761	10.00319
ORG	4	21	7.04	3.549
ENV	1	12	5.24	3.864
FSIZE	8.6072	11.1867	9.921628	.5691888
ROE	-.3886	3.2818	.556638	.6906165
LEV	.0649	.9046	.476949	.1871020

Notes:
AIFR=adoption of internet financial reporting. TECH=technological context.
ORG=organizational context. ENV=environmental context. FSIZE=firm size. ROE=return on equity. LEV=leverage.

3.5 Regression Analysis

The regression analysis was used to predict an outcome variable from one predictor variable with a model (Field, 2009). In this study, multiple regression analysis was done. In Table 7, the value of R Square is 0.130, which indicates that 13% of AIFSR can be explained by the model. Besides, the value of the adjusted R Square is 0.054, which means 5.4% of changes in AIFSR are explained by changes in variables.

Table 7 Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.360[a]	.130	.054	1.841

Notes:
a. Predictors: (Constant), LEV, ENV, TECH, ORG, ROE, FSIZE
b. AIFR=adoption of internet financial reporting. TECH=technological context. ORG=organizational context. ENV=environmental context. FSIZE=firm size. ROE=return on equity. LEV=leverage.

Next, the result of multiple regression analysis is shown in Table 8. The regression results show that only organizational is significant at 5%, with a p-value of 0.021 and a coefficient value of

0.165. This indicates that organizational has a significant and positive impact on AIFSR. With a unit increase in organizational, the AIFSR will be increased by 0.165 units. However, the other variables are showing no significant relationship with internet financial and sustainability reporting as their p-value is higher than 0.05, which is not considered as a significant level.

Table 8 Multi-Regression Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.693	5.080		.924	.359
	TECH	.002	.025	.011	.082	.935
	ORG	.165	.070	.310	2.356	.021**
	ENV	-.054	.059	-.110	-.910	.366
	FSIZE	.177	.541	.053	.327	.745
	ROE	-.039	.385	-.014	-.100	.921
	LEV	.946	1.185	.093	.798	.427

Notes:
a. Dependent Variable: AIFR
b. AIFR=adoption of internet financial reporting. TECH=technological context. ORG=organizational context. ENV=environmental context. FSIZE=firm size. ROE=return on equity. LEV=leverage.
c. ** Significant at 5%

4. DISCUSSION ON FINDING

This study analyses the influence of TOE on AIFSR. The first objective of this study is to examine technological context influence the AIFSR. Based on the multiple regression analysis, the technological context shows that there is no significant towards AIFSR with a p-value of 0.935. This result contrasts with the findings of Al-Arussi, Selamat, and Hanefah (2009), which showed that the level of technology was positively significant with internet disclosure. In terms of the technology innovation adoption perspective, this result also contrasts with Al-Jabri and Sohail (2012), in which the relative advantage of technology will positively influence the adoption. This result also inconsistent with previous findings that the compatibility level of technology will positively impact the adoption of technology innovation (Latiff *et al.,* 2017; Lutfi *et al.,* 2016). However, this result is consistent with Chiu, Chen, and Chen (2017) and Al-Jabri and Sohail (2012), in which the complexity level in technological context does not significantly associate with the adoption. Malaysia is a developing country. As the advancement of technology in Malaysia still has space for development, hence PLC unable to utilize the technology effectively to disclose their companies' information through the Internet.

Furthermore, the second objective of this study is to examine organizational context influence the AIFSR. The p-value of the organizational context is 0.021, which means that the organizational context is positively significant with AIFSR. This result is similar to most of the previous studies, in which the organization factor will influence internet financial and sustainability reporting (Homayoun and Rahman, 2010; Omran and Ramdhony, 2016). The top management has the decision on adopting innovation technology. Top management support shows a positive attitude towards the new technology adoption in order to reduce the level of resistance towards the adoption (Duan, Deng, and Corbitt, 2012). The board's effectiveness may depend on the frequency of board meetings. The board is the highest hierarchy in the company, the important decision is made by the board of directors. Therefore, the high frequency of board meetings indicates that the company will make the decision involve in technology adoption.

Moreover, another objective of this study is to examine the environmental context influence the AIFSR. The p-value of the environmental context is 0.366, which is not significant with internet financial and sustainability reporting adoption. This result is similar to previous studies. Based on the previous study done by Uyar (2012), the previous result showed that the industry sector does not have any impact on internet reporting. However, the result contrasts with various previous findings (Aly *et al.,* 2010; Dâmaso and Lourenço, 2011; Dolinšek *et al.,* 2014a). Different types of industries do not have any impact on the adoption of innovative technology by companies. As internet financial and sustainability reporting brings advantages to the companies, companies need to adopt internet financial and sustainability reporting regardless of the industry background.

5. CONCLUSION

This study was done to determine the factors that affect the AIFSR of PLC in Bursa Malaysia. Previously, various types of theories have been used to explain internet financial and sustainability reporting context such as Agency Theory, Signalling Theory, and Legitimacy Theory. The popular theory that been widely used by previous researchers is Agency Theory (Dolinšek and Lutar-Skerbinjek, 2018; Kamalluarifin, 2016; Lihniash, Egdair, and Ahmed, 2019). However, there is a lack number of studies on explaining AIFSR with DOI theory. Therefore, this study is to explain the AIFSR with DOI theory based on the TOE framework. Besides, there are new elements from DOI theory were being included in the TOE framework, which are relative advantage, complexity and comparability. Hence, a new TOE framework was constructed in this study.

The study suggests that the top management of the company should encourage the AIFSR as it enables information sharing with stakeholders in a timely, economically and efficiently manner. Besides, the confidence level of local and foreign investors will be increased by gaining a better understanding of the companies' financial information through the internet. The financial information disclosure is important to the investors to make a rational decision in their investment. Furthermore, this study serves as a guidance for Bursa Malaysia to ensure all PLC a certain level of internet disclosure to protect the interest of shareholders. Lastly, the future researcher can gain knowledge on the information of AIFSR in the technological context.

Although this study had made some significant contributions to the knowledge of AIFSR in Malaysia context, there is some limitation that needs to be addressed by future researchers. The data is based on the top 100 PLC companies. Larger sample size should be involved in future research in order to increase the reliability of the findings. Since the internet disclosure practices of companies may be changing over time, a study that involves more than one point at a time is needed to oversee the changing effect. Furthermore, the interview might help reveal factors that are not predetermined in affecting the adoption of internet financial and sustainability reporting. However, this study model also can be applied to other adoption of technology innovation instead of focusing on AIFSR.

The new TOE framework can be used to explain the AIFSR in a comprehensive approach with the focus in three main contexts such as technological context, organizational context and environmental context. Moreover, the company also will get a deeper understanding towards the factors of AIFSR and advantages from the innovation adoption based on the new TOE framework.

The sample of this study is the Top 100 PLC in Bursa Malaysia. The construction of internet financial and sustainability reporting index was based on the Top 100 PLC' websites. The content of the first page of the corporate website (IFR-1P), investor relations on the internet (IFR-IR), the annual report on the internet (IFR-AR) and other information on the internet (IFR-OI) were being

evaluated. Hence, the new scoring index of Top 100 PLC in Bursa Malaysia can be applied in future studies.

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REFERENCES

Al-Arussi, A. S., Selamat, M. H., & Hanefah, M. M. (2009). Determinants of financial and environmental disclosures through the internet by Malaysian companies. *Asian Review of Accounting, 17*(1), 59–76.

Al-Hajaya, K., & Sawan, N. (2018). The future of internet corporate reporting – creating the dynamics for change in emerging economies: A theoretical framework and model. *Corporate Ownership and Control, 15*(3), 172–188.

Al-Jabri, I. M., & Sohail, M. S. (2012). Mobile banking adoption: Application of diffusion of innovation theory. *Journal of Electronic Commerce Research, 13*(4), 379–391.

Alarussi, A. S., & Shamkhi, D. (2016). Company characteristics, dominant personalities in board committees and internet financial and sustainability disclosures by Malaysian Listed Companies. *Malaysian Management Journal, 20*, 59–75.

Almilia, L. S. (2015). Comparing internet financial and sustainability reporting practices: Indonesia, Malaysia, Singapore, Japan and Australia. *International Journal of Business Information Systems, 20*(4), 477–495.

Aly, D., Simon, J., & Hussainey, K. (2010). Determinants of corporate internet reporting: Evidence from Egypt. *Managerial Auditing Journal, 25*(2), 182–202.

Amran, A. (2012). Exploring online sustainability disclosure among Malaysian company. *Procedia-Social and Behavioral Sciences, 65*(0), 761-767.

Awa, H. O., Ukoha, O., & Emecheta, B. C. (2016). Using T-O-E theoretical framework to study the adoption of ERP solution. *Cogent Business and Management, 3*(1), 1–23.

Aziz, A. A., Ariffin, N. N. M., & Mohamed, I. S. (2011). Internet financial and sustainability reporting in Malaysia. *International Conference on Machine Learning and Computing, 3*, 302–306.

Aziz, N. S. A., & Bidin, R. H. (2017). A Review on the Indicators Disclosed in Sustainability Reporting of Public Listed Companies in Malaysia. *Journal of Human Capital Development (JHCD), 10*(2), 1-14.

Bagale, G. S. (2014). Determinants of E-Commerce in Indian MSME Sector: A Conceptual Research Model Based on TOE Framework. *Universal Journal of Management, 2*(3), 105–115.

Chiu, C.-Y., Chen, S., & Chen, C.-L. (2017). An integrated perspective of TOE framework and innovation diffusion in broadband mobile applications adoption by enterprises. International *Journal of Management, Economics and Social Sciences (IJMESS), 6*(1), 14–39.

Chong, S., Ali, I., & Lodhia, S. K. (2016). A model for gauging the prominence of web-based CSR disclosure. *Pacific Accounting Review, 28*(4), 431–445.

Cormier, D., Ledoux, M., & Magnan, M. (2009). The use of Web sites as a disclosure platform for corporate performance. *International Journal of Accounting Information Systems, 10*(1), 1–24.

Dâmaso, G., & Lourenço, I. C. (2011). Internet financial and sustainability Reporting: Environmental Impact Companies and other Determinants. International Conference on Enterprise Systems, Accenting and Logistics 2011, (July), 331–359.

Dolinšek, T., & Lutar-Skerbinjek, A. (2018). Voluntary disclosure of financial information on the internet by large companies in Slovenia. *Kybernetes, 47*(3), 458–473.

Duan, X., Deng, H., & Corbitt, B. (2012). Evaluating the critical determinants for adopting e-market in Australian small-and-medium-sized enterprises. *Management Research Review, 35*(3), 289–308.

Fuertes-Callén, Y., Cuellar-Fernández, B., & Pelayo-Velázquez, M. (2014). Determinants of online corporate reporting in three Latin American markets: The role of web presence development. *Online Information Review, 38*(6), 806–831.

García, A. C., & García-García, J. (2010). Determinants of online reporting of accounting information by Spanish local government authorities. *Local Government Studies, 36*(5), 679–695.

Halim, N. A., Basiruddin, R., & Ali, N. R. M. (2015). Measuring the Extent of Investor Relations on the Web: A Multi-dimensional Approach. *Procedia Economics and Finance, 31*(15), 714–721.

Hashim, M. H., Nawawi, A., & Salin, A. S. A. P. (2014). Determinants of Strategic Information Disclosure - Malaysian Evidence. *International Journal of Business and Society, 15*(3), 547–572.

Henchiri, J. E. (2011). Voluntary web-based disclosures by Moroccan and Tunisian companies. *EuroMed Journal of Business, 6*(2), 155–173.

Hindi, N. M., & Rich, J. (2010). Financial Reporting on the Internet: Evidence from the Fortune 100. *Management Accounting Quarterly, 11*(2), 11–22.

Homayoun, S., & Rahman, R. A. (2010). Determinants of Web-Based Corporate Reporting Among Top Public Listed Companies in Malaysia. *International Journal of Arts and Sciences, 3*(13), 187–212.

Hossain, M., Momin, M. A., & Leo, S. (2012). Internet financial and sustainability reporting and disclosure by listed companies: Further evidence from an emerging country. *Corporate Ownership and Control, 9*(4), 351–364.

Hoti, E. (2015). The technological, organizational and environmental framework of IS innovation adaption in small and medium enterprises. Evidence from research over the last 10 years. *International Journal of Business and Management, 3*(4), 1–14.

Hue, T. T. (2019). The determinants of innovation in Vietnamese manufacturing firms: an empirical analysis using a technology–organization–environment framework. Eurasian Business Review, (0123456789).

Ilias, A., Razak, M. Z. A., & Rahman, R. A. (2015). The Quality of Presentation and Content for Internet Business Reporting (IBR) on Malaysian Public Listed Companies (PLCS). *The Journal of Developing Areas, 49*(5), 253–261.

Jia, Q., Guo, Y., & Barnes, S. J. (2017). Enterprise 2.0 post-adoption: Extending the information system continuance model based on the technology-Organization- environment framework. *Computers in Human Behavior, 67*, 95–105

Kamalluarifin, W. F. S. W. (2016). The Influence of Corporate Governance and Firm Characteristics on the Timeliness of Corporate Internet Reporting by Top 95 Companies in Malaysia. *Procedia Economics and Finance, 35*(16), 156–165.

Keliwon, K., & Aziz, K. A. (2005). Web financial reporting in Malaysia. The current stage. Proceedings of International Conference on E-Commerce 2005, 59–65. Retrieved from *http://scholar.google.com.my/scholar?q=khairul+azman+aziz+web+financial+reporting&btnG=&hl=en&as_sdt=0%2C5#0.*

Keliwon, K., Shukor, Z. A., & Hassan, M. S. (2018). Internet financial and sustainability Reporting (IFR) Disclosure Position and Firm Value. *Asian Journal of Accounting and Governance, 9*, 111–122.

Kelton, Andrea S, & Yang, Y. (2008). The impact of corporate governance on Internet financial and sustainability reporting. *Journal of Accounting and Public Policy, 27*(1), 62–87.

Khan, M. N. A. A., & Ismail, N. A. (2011). The Level of Internet financial and sustainability Reporting of Malaysian Companies. *Asian Journal of Accounting and Governance, 2*(1), 27–39.

Khan, M. N. A. A., & Ismail, N. A. (2012). An empirical study on the indexes of internet financial and sustainability reporting: The case of Malaysia. *African Journal of Business Management, 6*(5), 2086–2100.

Kiew-Heong, Y., & Saleh, Z. (2011). Internet financial and sustainability Reporting in Malaysia: The Preparers' View. *Asian Journal of Finance & Accounting, 3*(1), 138–161.

Kuruppu, N., Oyelere, P., & Al-Jabri, H. (2015). Internet financial and sustainability Reporting and Disclosure Practices of Publicly Traded Corporations: Evidence from Sri Lanka. Accounting & Taxation, *7*(1), 75–91.

Latiff, D. I. A., Yaassin, M. A.-I., Ramli, N., Ridzuan, A. R., Mohideen, R. S., & Ghani, S. N. F. F. (2017). Understanding Innovation Diffusion Attributes Towards Internet TV Adoption in Enhancing Students Learning Experience. *Journal of Academia UiTM Negeri Sembilan, 5*, 178–186.

Lihniash, S. M. A., Egdair, I. M. M., & Ahmed, S. (2019). Exploring the Role of Technology and Internet financial and sustainability Reports on Financial Report Users in Libyan Financial Organizations. *Journal of Accounting, Auditing and Taxation, 3*(1), 25–31.

Mohamed, I. S., Omar, N., Daud, N. M., & Marthandan, G. (2009). Assessing Drivers of Web Technology Investment in Malaysia Service Industry: An Application of Technological, Organizational and Environmental (TOE) Model. International Conference on Information and Multimedia Technology, 221–225.

Ojah, K., & Mokoaleli-Mokoteli, T. (2012). Internet financial and sustainability reporting, infrastructures and corporate governance: An international analysis. *Review of Development Finance, 2*(2), 69–83.

Omran, M. A., & Ramdhony, D. (2016). Determinants of internet financial and sustainability reporting in African markets: the case of Mauritius. *The Journal of Developing Areas, 50*(4), 1–18.

Pervan, I., & Bartulović, M. (2017). Determinants of Internet financial and sustainability Reporting of Croatian Banks – Panel Analysis. The Economies of Balkan and Eastern Europe Countries in the Changed World, 170–181.

Ribeiro, V. P. L., Monteiro, S. M. D. S., & Moura, A. M. D. A. E. (2016). Determinants of sustainability e-reporting in Portuguese municipalities: An institutional and legitimacy theoretical framework. *Developments in Corporate Governance and Responsibility, 10,* 131–163.

Rogers, Everett M. (2003). Diffusion of Innovation (5th ed.). New York: Free Press.

Rostami, M., & Nayeri, M. D. (2015). Investigation on XBRL Adoption Based on TOE Model. British *Journal of Economics, Management & Trade, 7*(4), 269–278.

Salehi, M., Moradi, M., & Pour, A. A. (2010). A Study of the Integrity of Internet financial and sustainability Reporting: Empirical Evidence of Emerging Economy. *Global Journal of Management and Business Research, 10*(1), 148–158.

Turmin, S. Z., Hamid, F. A., & Ghazali, N. A. M. (2016). Corporate internet reporting within Malaysian economic sectors. *International Journal of Economics and Management, 10*(2), 379–389.

Uyar, A. (2012). Determinants of corporate reporting on the internet. An analysis of companies listed on the Istanbul. *Managerial Auditing Journal, 27*(1), 87–104.

Zhang, X., Yu, P., Yan, J., & Spil, I. T. A. M. (2015). Using diffusion of innovation theory to understand the factors impacting patient acceptance and use of consumer e-health innovations: A case study in a primary care clinic Healthcare needs and demand. BMC Health Services Research, *15*(1), 1–15.