Does Age Matter? A Closer Look at Technology Readiness of CPAs in Public Accounting Practice in the Philippines

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Abstract - **The typical public accounting firm of today is composed largely certified public accountants (CPAs) or external auditors who are "millennials" (Tugas & Tullao, 2017). Millennials are those born between 1979 and 1994 (Myers & Sadaghiani, 2010). As a generational group, they are believed to be more technology savvy and are more adaptive to changes brought about by technological breakthroughs. As such, it would be a remiss to disregard their apparent presence in the public accounting practice – an industry that is vastly affected by innovations in technology. This study focuses on how age affects the technology readiness (TR) of external auditors in public accounting firms (with international affiliations) in the Philippines. The TR scores were determined using the TR index version 2.0 instrument of Parasuraman and Colby (2015). Responses obtained from 609 CPAs revealed that age significantly affects technology readiness, that older CPAs have higher TR scores than younger CPAs, and that majority (74.2%) of the CPAs in public practice are either explorers or skeptics. It is, therefore, recommended that public accounting firms make use of the technology belief segmentation when implementing new technologies, that Commission on Higher Education (CHED) revisit the prescribed Accountancy program curricula with respect to new technologies, that Professional Regulatory Board of Accountancy (PRBOA) increase required information and communications technology (ICT) – related continuing professional development (CPD) credit units when accrediting CPAs in public practice, and that future researchers utilize TR scores in quantifying human-technology interaction competencies.**

Keywords: **age, certified public accountants, external auditors, millennials, public accounting practice, technology readiness**

I. INTRODUCTION

The public accounting practice of the accountancy profession is a peculiar one. As a sector, it is the most regulated for it provides the highest level of assurance in rendering financial statement audit services. Thus, the highest level of independence is required of them at all times. Secondly, businesses covered by regulatory requirements are duty-bound to subject their financial statements to annual audit. In the same manner, external auditors are required to comply with legal, regulatory, and professional standards when performing audit services. Furthermore, certified public accountants (CPAs) in this sector are required the most number of accreditations from regulators which include the Bureau of Internal Revenue (BIR), the Securities and Exchange Commission (SEC), the Professional Regulatory Board of Accountancy (PRBOA), among others. As such, this sector is worth studying.

According to the Philippine Institute of Certified Public Accountants (PICPA), the accredited professional organization of CPAs in the Philippines, the public practice or "public accounting practice" has 9,694 members in good standing (Table 1). They comprise 36% of the CPAs in the Philippines making public accounting practice as the sector with the most number of CPAs.

Table 1
MEMBERS OF PHILIPPINE INSTITUTE OF CERTIFIED PUBLIC ACCOUNTANTS (PICPA) AS OF DECEMBER 2017 (PICPA HEAD OFFICE)

Classification of Members per Sector	Members in Good Standing	%	Members not in Good Standing	Total Members	%
Education/Academe	965	3.61	2,562	3,527	2.44
Commerce and Industry	9,206	34.42	52,034	61,240	42.35
Government	3,089	11.55	14,068	17,157	11.86
Public Practice	9,694	36.25	19,699	29,393	20.32
No Sector	3,789	14.17	29,511	33,300	23.03
Total	26,743	100.00	117,874	144,617	100.00

Globally, the public accounting practice is a US$186 billion industry (Irvine, 2016). Four accounting firms dominate this sector. Collectively referred to as the Big Four, they are PricewaterhouseCoopers (PwC), Deloitte, Ernst & Young (EY), and KPMG which as a group is responsible for the 66.5% of the total global industry revenues (Irvine, 2016). Presented in Table 2 is the list of top accounting firms in the world in terms of revenues with their counterparts in the Philippines. It can be said, therefore, that public accounting practice contributes significantly in the revenue-generation of a particular economy.

Table 2 TOP ACCOUNTING FIRMS IN THE WORLD PER TOTAL REVENUES (IRVINE, 2016)		
Accounting Firm - Global	**Local Counterpart – Philippines**	**(in US$ Bn)**
PwC	Isla Lipana & Co.	35.356
Deloitte	Navarro Amper & Co.	35.200
Ernst & Young	SGV & Co.	28.655
KPMG	R.G. Manabat & Co.	24.440
BDO	BDO Alba Romeo & Co.	7.304
RSM	Reyes Tacandong & Co.	4.641
Grant Thornton	Punongbayan & Araullo	4.632
Baker Tilly International	Constantino Guadalquiver & Co. CPAs	3.807
Crowe Horwath International	Ramon F. Garcia & Company CPAs	3.507
Nexia	Maceda Valencia & Co.	3.083

The workforce of the public accounting practice can be classified into these generations: (1) Silent Generation (born 1928-1945); (2) Baby Boomer (born between 1946-1964); (3) Generation X (born 1965-1980); and (4) Generation Y-Millennials (1981-2004) (American Census Bureau as cited by Pulevska-Ivanovska et al., 2017).

In 2017, the Baby Boomer generation consists of individuals who were between 53 to 71 years in age. They are believed to have built and defined most of today's organizational cultures and identity through their personal ideals, values, and identity (Huyler et al., 2015). Moreover, belonging to the Generation X are those 37 to 52 years in age in 2017. They are believed to have embraced job satisfaction, quality of life, and workplace empowerment (Yu & Miller, 2005). Lastly, the Generation Y individuals, referred to as Millennials, were born to a rapidly changing era. Also known as the digital generation, they are believed to have been the most exposed to technology and are entrenched by its advancement and development (Martin, 2005). There are two schools of thoughts with respect to the year millennials were born. Myers & Sadaghiani (2010) and Martin (2005) consider those born between 1979 and 1994 (at least 21 years old by 2000) as millennials. On the other hand, Huyler et al. (2015) and Pulevska-Ivanovska et al. (2017) identify those born after 1980 or 1982 onwards (at least 18 years old by 2000) as millennials. For this research study, the former operational definition was used. The current workforce is dominated by the millennials. As published by Pew Research Center in 2018, millennials became the largest generation in the United States (US) labor force in 2016. This was a development from an earlier report in 2015 on the millennials surpassing the Generation X as the largest generation.

The public accounting practice is not exempt from the challenges brought about by the changes in technological landscape. The close of the 20th century described as increasing audit automation and use of internet gave the profession a whole new look (Gomez, 2017; Bentancourt, 2016; Pepe, 2011). Empirical evidence also supports that the use of information technology results in significant productivity gains, in the case of one public accounting firm studied by Banker, Chang, and Kao in 2002.

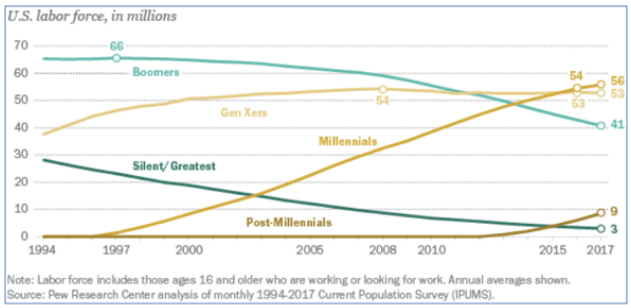

Figure 1. Generational groups in the US labor force (Pew Research Center, 2018).

As the 21st century started to unfold, the profession was once again subjected to technological turbulence. Breakthroughs in the Fourth Industrial Revolution ("the Fourth") have paved a way to the emergence of cloud computing, Internet of Things, artificial intelligence (which includes robotics), and even "blockchain" which again challenge the future of the public accounting profession (Hood, 2017; Grimes, 2017; Raphael, 2017; Mangundaya, 2017; Pepe, 2011). As a matter of fact, public accounting firms and their clients are increasingly moving their business operations to the cloud which allows both parties to access data anytime and from anywhere (Lechleitner, 2015). In a similar vein, the 2015 survey of the IFAC on small- and medium-sized public accounting firms from 169 countries revealed that 72% of the respondents identify keeping up with technology as a significant challenge to their public practice (Gomez, 2016). With emphasis on the Fourth as a revolution of velocity, scope, and systems impact, the CPAs of today are waking up every day to a time where technology is at its most agile and dynamic yet (Hood, 2017; Schwab, 2016).

The focus of this study, therefore, is age affecting technology readiness (TR) of CPAs in public accounting practice. It therefore answers the question: up to what extent does age affect TR of CPAs in public accounting practice in the Philippines? Moreover, it seeks to achieve the following objectives: (1) to assess CPAs in public accounting firms according to the four dimensions of technology readiness (optimism, innovativeness, discomfort, and insecurity); (2) to assess CPAs in public accounting firms according to the five segments based on distinct combinations of technology-related beliefs of technology readiness (skeptics, explorers, avoiders, pioneers, and hesitators); (3) to assess the technology readiness of CPAs in public accounting practice in terms of age;

and (4) to investigate the effect of age on TR of CPAs in public accounting practice. The working hypothesis, therefore is:

H_1 Age does not significantly affect technology readiness of CPAs in public accounting practice.

As to significance, results of this study would be significant to public accounting firms to understand the interplay among generational groups in the workplace, regulators such as the Commission on Higher Education (CHED) and the Professional Regulatory Board of Accountancy (PRBOA) to improve the quality of accountancy education in the Philippines, and future researchers to pursue similar and other studies on technology affecting the public accounting practice.

Framework Development and Literature Review

This study is anchored on socio-technical model of technology acceptance (STMTA) replacement-complement continuum developed by Tugas and Tullao (2017). As depicted in Figure 2, as technology acceptance decreases, the probability of technology replacement increases. Conversely, as technology acceptance increases, the probability of technology replacement decreases. Moreover, technology acceptance can be function of technology readiness as, conceptually, readiness precedes acceptance. Technology readiness is the individual's "propensity to embrace and use new technologies for accomplishing goals in home life and at work" (Parasuraman, 2000, p. 308).

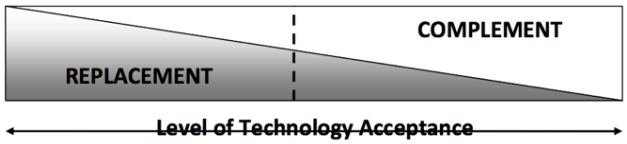

Figure 2. STMTA Replacement-Complement Continuum.

As to technology readiness, this is supported by paradoxes of technology as advocated by Mick and Fournier (1998) which posits that technology is both an enabler and an inhibitor to the user. As the concept implies, paradoxes of technology recognizes that technology can trigger both positive and negative feelings to the user. It can facilitate the feeling of intelligence or ignorance in the same way that it can also result in the feeling of efficacy or ineptitude. Worded differently, technology can both complement and alienate. Seeing its applicability, Parasuraman (2000) and Parasuraman and Colby (2015) use this as conceptual underpinning of their works on technology readiness.

As cited by Tugas and Tullao (2017), technology readiness is a personality-related variable appropriate for technology acceptance. As a construct, it represents the "overall state of mind resulting from a gestalt of mental enablers and inhibitors that collectively determine a person's predisposition to use new technologies" (Parasuraman, 2000, p. 308). Technology readiness, therefore, is an individual-level characteristic that does not change in the short-term nor does it change suddenly in response to a stimulus (Parasuraman & Colby, 2015). It is multi-faceted, comprising of four dimensions: (1) optimism (OPT) – a positive view of technology and a belief that it offers people increased control, flexibility, and efficiency in their lives; (2) innovativeness (INN) – a tendency to be a technology pioneer and thought leader; (3) discomfort (DIS) – a perceived lack of control over technology and feeling of being overwhelmed by it; and (4) insecurity (INS) – distrust of technology, stemming from skepticism about its ability to work properly and concerns about its potential harmful consequences. The first two dimensions make up the technology adoption motivators while the last two comprise the technology adoption inhibitors (Parasuraman & Colby, 2015, p. 60).

The 2000 study of Parasuraman resulted in the development of the first version of technology readiness index (TRI 1.0), a survey instrument that measures a person's technology readiness. The TRI 1.0 consists of 36 items clustered into the four dimensions. Fifteen years later, Parasuraman, together with Colby, revisited TRI 1.0 and developed a second version which is being referred to as "TRI 2.0." The main reason for the revisit was the emergence of revolutionary technologies (smartphone technology, social media, cloud computing, artificial intelligence) that were still at their infancy stage the time the first version was developed in 2000. The resulting survey instrument, referred to as TRI 2.0, was compared with TRI 1.0 and tested in terms of content, structure, and psychometric properties. The 16-item TRI 2.0 demonstrated reliability, validity, and usefulness as a customer segmentation tool based on technology-personality traits. Another unique feature of TRI 2.0 is that it can classify people into five segments in terms of technology readiness as follows: (1) explorers (high motivation, low inhibition); (2) pioneers (high motivation, high inhibition); (3) skeptics (low motivation, low inhibition); (4) hesitators (low to moderate motivation, high inhibition); and (5) avoiders (low motivation, high

inhibition). The five segments are also presented in Table 3.

Table 3
TECHNOLOGY READINESS SEGMENTS AND BELIEF STRUCTURES

Segments	Motivation		Inhibition	
	Optimism	Innovativeness	Discomfort	Insecurity
Explorers	High	High	Low	Low
Pioneers	High	High	High	High
Skeptics	Low	Low	Low	Low
Hesitators	Moderate	Low	High	High
Avoiders	Low	Low	High	High

In determining technology readiness index, the lowest and highest indices are 1 and 5, respectively. As per the Rockbridge Associates, Inc., to define low, moderate, and high in quantitative terms, the following guide is being used: (1) low [1.00 to 2.33]; (2) moderate [2.34 to 3.67]; and (3) high [3.68 to 5.00] (Illescas, Odsinada, Santos, & Suguitan, 2009).

Moreover, the literature on technology readiness is a growing field. As cited by Tugas and Tullao (2017), Kuo (2011) investigated the effect of bank customer's personal factors on their TR, customer relationship management (CRM) of the financial services and relationship quality (RQ) with the bank, and the relationships among TR, CRM, and RQ. Data were collected from 713 customers from 12 local banks in Taiwan. Results showed that personal factors significantly influence TR and CRM, that TR has a significant impact on CRM and RQ, and that CRM has significant influences on RQ. Similarly, Massey, Khatri, and Montoya-Weiss (2007) related TR with usability. Data were collected from 160 students in the United States. Their results indicated that TR customer segments vary in usability requirements and usability evaluations of specific online service interfaces are influenced by complex interactions among site type, access method, and TR segment membership. Moreover, Gupta and Garg (2015) applied TR among e-banking users in India. In South Africa, Berndt, Saunder, and Petzer (2010) applied TR in assessing the banking industry. In Brazil, De Souza and Luce (2003) assessed the applicability of TR in the context of consumer adoption of technology-based products and services. In the Philippines, an unpublished undergraduate thesis by Illescas et al. (2009) assessed the TR of accounting educators. The table that follows shows the summary of the TR scores obtained from earlier studies (Table 4).

Table 4
SUMMARY OF TECHNOLOGY READINESS SCORES (MEAN AND SD) FROM EARLIER STUDIES

Study	N	OPT		INN		DIS		INS		TRI	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Illescas et al. (2009)	199	4.23		3.54		3.40		3.79		3.15	0.30
Kuo (2011)	713									3.44	0.63
Massey et al. (2007)	160									3.40	
Gupta and Garg (2015)	490									3.20	0.34
Berndt et al. (2010)	2,475	3.99	0.79	3.12	0.97	3.26	0.71	3.74	0.80	2.53	0.57
De Souza and Luce (2003)	731										
1999 NTRS*		3.84		3.18		3.46		4.03		2.88	
2012 NTRS**		3.75	0.80	3.02	1.02	3.09	0.84	3.58	0.83	3.02	0.61

**Parasuraman (2000); **Parasuraman and Colby (2015); NTRS = National Technology Readiness Survey*

As to age affecting technology readiness, this is supported by social cognitive theory (Bandura, 1988). It attempts to understand and predict how learning takes place by explaining psychosocial functioning in terms of triadic reciprocal causation. In this causal model, behavior, cognitive, and other personal factors, and environmental events all operate as interacting determinants that influence each other bi-directionally. In connection with this, Bandura (1988) also considers personality as an interaction between three components: the environment, behavior, and one's psychological processes (one's ability to entertain images in minds and language) which can be largely affected by age. They operate interactively as determinants of learning. As such, it can be expected that older people have been more exposed and immersed to the environment, different behaviors, and psychological processes than younger people. Thus, they are expected to have higher technology readiness. On the contrary, the younger, composed mostly of millennials, are described as technology savvy since they were born and raised in a time where technological innovations have started taking-off. In a report published by the Pew Research Center in 2015, they have identified that 74% of the millennials believe that new technology makes life easier, that 54% of them believe that new technology makes people closer to their friends and family, and that 56% of them believe that new technology allows people to use their time more efficiently (Pew Research Center, 2015). Following this line of thought, it can be surmised that younger people have higher technology readiness. This, therefore, makes this research study interesting and worth pursuing.

II. RESEARCH METHOD

This study is quantitative in approach with a descriptive and causal design that is geared toward an investigation as to effect of age on technology readiness of CPAs in public practice in the

Philippines. The unit of analysis is the external auditor in 11 Philippine public accounting firms with international affiliation. The sample frame that was used was the list of CPAs in good standing obtained from PICPA as of June 2016. A total of 23,610 CPAs were in public practice and only 8,502 were in good standing. Systematic random sampling was employed in this study. More specifically, this was done by determining the initial sample size based on global revenues. For the additional firms without data on global revenues, the least amount of revenue was used. This resulted in a target sample size of 368.

Actual data collection took place from April 19, 2017 to June 16, 2017 and it was done through a survey. The survey instrument on technology readiness (16 items) was adapted from the second version of technology readiness index (TRI 2.0) of Parasuraman and Colby (2015). Consent was sought prior to administration. The response for each item is answered using Likert's five-point scale. The responses make use of alphabetic and not numerical equivalents as suggested by Parasuraman and Colby (2015) to reduce response biases. Both hard copy and electronic means of data collection were utilized.

Responses from the hard-copy accomplished questionnaires were manually encoded in an Excel sheet. Responses from online survey were also manually added to the same sheet. Prior to processing the data, reverse coding of the negative items in the questionnaire was performed. Thereafter, two levels of data analysis were employed: (1) descriptive; and (2) inferential. Descriptive analysis was used to achieve the first three objectives while analysis of variance (ANOVA) was applied to achieve the fourth objective.

III. RESULTS AND DISCUSSION

A total of 648 accomplished survey forms were received, 39 of which were defective due to skipped items and items with more than one answer. This resulted in 609 usable responses, 241 responses more than the targeted number. All, except two, of the public accounting firms were able to return at least the targeted number of responses. The other two public accounting firms lacked a total of 50 responses. To compensate for this, the researchers decided to use all the usable responses for data analysis since there was also a total of 291 excess responses from the nine public accounting firms that returned more than the targeted number of responses. Needless to say, larger sample size also results in better appreciation of the descriptive statistics.

Table 5
SUMMARY STATISTICS IN TERMS OF AGE (N=609)

Years	Frequency	Percentage
Less than 20	2	0.33
20 to 24	416	68.31
25 to 29	149	24.47
30 to 34	27	4.43
35 to 39	10	1.64
40 to 44	4	0.66
45 to 49	1	0.16
Total	609	100.00

In terms of age, 68.31% of the respondents are aged "20 to 24 years" (Table 5). This is followed by those aged "25 to 29 years" (24.47%). Forty-two (6.89%) of the respondents are aged 30 years and above. This means that majority (92.78%) of CPAs in public accounting firms in the Philippines are aged 20 to 29 years old. With the number dipping down as they age 30 years and above, this is an indication of high attrition rate.

Table 6 below shows the summary statistics on technology readiness dimensions.

Table 6
SUMMARY STATISTICS ON TECHNOLOGY READINESS DIMENSIONS (N=609)

	Mean	Median	Minimum	Maximum
Optimism	4.00	4.00	1.25	5.00
Innovativeness	3.27	3.25	1.50	5.00
Discomfort	3.37	3.25	1.00	5.00
Insecurity	2.51	2.50	1.00	5.00
Technology Readiness	3.29	3.25	1.94	4.63
	Standard Deviation	**Skewness**	**Kurtosis**	**Range of means from earlier studies**
Optimism	0.59	-0.59853	0.92702	3.69 to 4.23
Innovativeness	0.62	0.07639	-0.10889	2.71 to 3.82
Discomfort	0.72	-0.39803	0.50809	3.09 to 3.46
Insecurity	0.70	0.33423	0.06388	2.01 to 4.03
Technology Readiness	0.36	0.23353	0.60649	2.53 to 3.68

Based on Table 6, the respondents score in optimism dimension the highest (mean of 4.00) and in insecurity dimension the lowest (mean of 2.51). With respect to standard deviation, optimism dimension has the lowest (0.59) and discomfort dimension the highest (0.72). With respect to range, innovativeness dimension has the lowest (3.50) and discomfort and insecurity dimensions have the highest (4.00). Most responses in optimism dimension are above 3 as evidenced by the data being skewed to the left while most responses in the innovativeness dimension are below 4 as evidenced by the data being skewed to the right. Most

responses in discomfort dimension are below 3 as evidenced by the data being skewed to the left while most responses in insecurity dimension are above 3 as evidenced by the data being skewed to the right. The overall TR mean is 3.29 with a standard deviation of 0.36 and a range of 2.69. The technology readiness scores of the respondents are mostly below 4 as evidenced by the data being skewed to the right.

Earlier studies on technology readiness register optimism dimension means ranging from 3.69 to 4.23, innovativeness dimension means ranging from 2.71 to 3.82, discomfort dimension means ranging from 3.09 to 3.46, insecurity dimension means ranging from 2.01 to 4.03, and TR means ranging from 2.53 to 3.68. All TR-related means computed in this research study fall within those ranges. Looking at the means of the four TR dimensions and applying the guide recommended by the Rockbridge Associates, Inc., the respondents have a moderate technology readiness mean (3.29). If they were one person, they would fall under the pioneer technology belief segment (Table 7). They tend to hold both strong positive and negative views about new technology (Parasuraman & Colby, 2015). This can be attributed to their strong adherence to professional skepticism. As external auditors, they view client assertions as neither correct nor incorrect unless adequately substantiated.

Table 7
DETERMINING THE TECHNOLOGY BELIEF SEGMENT OF EXTERNAL AUDITORS IN THE PHILIPPINES

	Mean	Qualitative Equivalent
Optimism	4.00	High
Innovativeness	3.27	Moderate
Discomfort	3.37	Moderate
Insecurity	2.51	Moderate
Technology Readiness	3.29	Moderate
Conclusion		**Pioneer**

The high optimism dimension mean indicates that the respondents find new technologies as something that will provide them increased control, flexibility, and efficiency in their lives as auditors. This means that even prior to using or having the new technology; they are positive and have already believed that such new technology will bring those benefits. In terms of innovativeness, they are moderately motivated to use and enjoy trying the new technology. Unlike highly innovative persons, they will find ease of use more important in deciding whether or not to try a new technology. The moderate discomfort dimension mean indicates that they still see new technologies as something that will overwhelm them. Control of technology is an issue for them. Much to their desire to try a new technology, the thought that they may not fully control such will prevent them from trying to use the new technology. This can also be attributed to their adherence to conservatism – expecting "less than" when more likely there is "more than." The moderate insecurity dimension mean can also be attributed to their adherence to professional skepticism. Trust is something huge for external auditors. As such, fully trusting that a new technology will work properly and that potential glitches associated with it are kept at a minimum may take time for them to do.

Table 8 shows how the 609 respondents are classified according to five technology-related belief segments.

Table 8
SUMMARY STATISTICS ON TECHNOLOGY READINESS PER BELIEF SEGMENT (N=609)

Segment	Frequency	%	ND* %	Means (Ranks)				
				OPT	INN	DIS	INS	Total TRI
Skeptics	210	34.5	32.0	3.53 (4)	2.99 (3)	3.38 (4)	2.45 (4)	3.09 (4)
Explorers	242	39.7	15.6	4.37 (1)	3.67 (1)	2.97 (5)	2.17 (5)	3.29 (2)
Avoiders	9	1.5	15.9	2.42 (5)	2.28 (5)	3.89 (2)	3.33 (1)	2.98 (5)
Pioneers	89	14.6	18.7	4.24 (2)	3.53 (2)	4.08 (1)	3.26 (2)	3.78 (1)
Hesitators	59	9.7	17.8	4.08 (3)	2.39 (4)	3.83 (3)	2.84 (3)	3.28 (3)

**ND=2016 normative data (sent by Rockbridge Associates, Inc.)*

Majority (74.2%) of the respondents fall under explorers (39.7%) and skeptics (34.5%) segments. About one-fourth (24.3%) of them belong to pioneers and hesitators segments and only very few (1.5%) belong to avoiders segment. This distribution is obviously different from the 2016 normative global data sent by Rockbridge Associates, Inc. The distribution is expected to have skeptics with the most number of respondents and the rest having close percentages. Table 8 indicates that majority of the respondents are either explorers (54%) or skeptics (46%). Explorers usually have high degree of motivation and low degree of resistance whereas skeptics usually have a detached view of technology, with less extreme positive and negative beliefs (Parasuraman & Colby, 2015). This may appear not consistent with the earlier discussion on classifying the respondents as pioneers if they were one person. Apparently, that was arrived at by looking at the combination of overall mean per TR dimension and overall TR mean whereas the segmentation now is based on the interplay among TR dimensions scores per individual which is supported by the fact that the rankings among segments per TR dimension are consistent with the rankings in the TRI 2.0 survey instrument. Nevertheless, the pioneers posted the highest TR mean (3.78) which can support the earlier classification of the respondents as pioneers if they were one person.

Taking further the discussion on explorers and skeptics as among the majority of the respondents, this is indicative of a strong adherence of external

audit CPAs to professional skepticism. Both are highly concerned about risks associated with technology controlling them and technology not being secure. This is expected because as external auditors, they strongly believe that professional judgment (forming audit opinion) can only be done by humans and least likely be delegated to technology. Security in technology is also of high concern because integrity of financial data is fundamental in rendering financial statement audit services. When technology puts integrity of the financial data at a material risk level, quality of audit work is compromised. As to motivators, these two segments are exact opposites. Explorers have high degree of motivation while skeptics have low degree of motivation. This can be attributed to two types of personality based on risk appetite, those who are aggressive and those who are conservative. The two belief segments are in either end of the spectrum. They can serve as checks and balances. Nevertheless, it is comforting to know that a sizable portion of external auditors in the Philippines are explorers for they are usually the technology pioneers and thought leaders (Parasuraman & Colby, 2015). The impact of technological innovations in the Fourth can be best managed by aggressive trail blazers who can be best pacified by calculated risk-takers.

Lastly, it can be observed that in terms of number and TR mean, avoiders are the fewest and have the lowest, respectively. For avoiders to have the lowest TR mean is expected as this is consistent with the TRI 2.0 results of Parasuraman and Colby (2015). They are expected to have the lowest TR mean because they usually have high degree of resistance and low degree of motivation (Parasuraman & Colby, 2015). As a result, they can be hostile to changes (Illescas et al., 2009). Having them as the fewest among external auditors is good as technological innovations are expected to increase in the Fourth (Hood, 2017; Schwab, 2016).

Table 9 shows the summary statistics on technology readiness means in terms of age.

Table 9
SUMMARY STATISTICS ON TECHNOLOGY READINESS AND AGE (N=609)

Years	Frequency	Percentage	Technology Readiness Mean
Less than 20	2	0.33	2.56
20 to 24	416	68.31	3.28
25 to 29	149	24.47	3.30
30 to 34	27	4.43	3.27
35 to 39	10	1.64	3.46
40 to 44	4	0.66	3.67
45 to 49	1	0.16	3.19
Total	609	100.00	3.29

In terms of age, respondents aged “40 to 44 years” have the highest TR mean (3.67) while respondents aged “less than 20 years” have the lowest TR mean (2.56). Only those respondents aged “25 to 29 years,” “35 to 39 years,” and “40 to 44 years” have TR means higher than the overall TR mean (3.29). This is consistent with the findings of Illescas et al., (2009) where older accounting teachers registered higher TR means than those who are not. This can also be attributed to audit experience as this relates to age. Staying longer in the firm means exposure to more audit engagements that require technology use. This enables the external auditors to be open and be ready to any new technology that may be rolled out by the public accounting firm.

As to inferential statistics, results of ANOVA confirmed that age significantly affects technology readiness, p-value of 0.017 at .05 alpha, thereby **rejecting the null hypothesis**. This result contradicts the findings of Illescas et al. (2009) concluding that technology readiness scores of accounting teachers are insensitive to age. Moreover, it was expected that younger external auditors have higher TR scores. Apparently, results showed older external auditors have higher TR scores with the highest TR mean in “40 to 44 years” group. This negates the idea that millennials have higher technology readiness as surmised from the report published by Pew Research Center (2015) and supports social cognitive theory that older people tend to have higher technology readiness because they have been more exposed and immersed to the environment, different behaviors, and psychological processes, technology or not, than younger people.

IV. CONCLUSIONS

The focus of this study is on age affecting technology readiness of CPAs in public accounting practice in the Philippines. It was hypothesized that age will not significantly affect technology readiness. Using ANOVA, the results provide statistical evidence that age significantly affects technology readiness. In summary, results of this study yielded three notable insights: (1) the technology readiness level (3.29) of CPAs in public accounting practice falls within the 2.53 and 3.68 TR range of earlier studies; (2) majority (74.2%) of the CPAs in public accounting practice are either explorers or skeptics. They have high inhibition with respect to being technology ready. True to their

profession, they embrace professional skepticism and conservatism even in their technology readiness; and (3) age favors the older CPAs in public accounting practice.

V. RECOMMENDATIONS

Public accounting firms

It is recommended that public accounting firms make use of the technology belief segmentation when implementing new technologies. The segmentation can be more of use when corroborated with technology readiness scores. Results of technology readiness can also be used as a valuable input in coming up with business and IT strategies so that they will be more appropriate and realistic. It also recommended that public accounting firms make use of the STMTA to locate external auditors in the replacement-complement continuum. This can serve as a diagnosis for potential and future intervention. Moreover, it can be expected that technology readiness scores of CPAs may decline nearing retirement. In such a case, to manage transition and succession, the human resources (HR) team should craft customized training designs for these CPAs who still participate in making huge decisions for the public accounting firms.

Commission on Higher Education (CHED)

Given that there is statistical evidence supporting that the technology readiness scores of younger external auditors are lower than the older external auditors, it is recommended that the prescribed Bachelor of Science in Accountancy (BSA) program curriculum be revisited. Focusing on IT courses, the curriculum has to be reviewed as to content and number of units required. A benchmarking team can also be formed in support to this. This team can study the curricula of top institutions in Asia that offer BSA program. CHED needs also to involve more public accounting firms in developing prescribed curriculum. With the advent of K-12 basic education curriculum implementation, this can be re-aligned vis-à-vis the emergence of the four proposed programs under the BSA track. Finally, to ensure implementation, a monitoring team should be formed to visit on a surprise basis higher education institutions that offer BSA programs.

Professional Regulatory Board of Accountancy (PRBOA)

As one of the regulators overseeing the practice of Accountancy in the Philippines, PRBOA should make use of the technology readiness scores to decide whether or not an intervention would be necessary with respect to technology readiness of external auditors. With respect to the results, the TR mean is moderate. Apparently, there is statistical evidence to support that younger external auditors have lower TR scores. Because of this, it is recommended that interventions should be performed. This can be done in two ways: (1) include more items on information and communication technology (ICT) in the licensure examination for certified public accountant (LECPA); and (2) increase CPD credit units in ICT when accrediting CPAs in public accounting practice.

Future researchers

The usual enterprise sets strategic alignment of business goals and information technology (IT) goals. Based on the results of this study, it is recommended that studies incorporating human component, which is the TR of individuals, be pursued. Being optimistic, a triangulation model of business, IT, and human may be proposed. The resulting business-IT-human goals alignment can make use of TR scores to quantify the measures of human-technology interaction competencies. Finally, the researchers find the existing age bracket for the millennial generational group broad that dividing it further into early millennials, millennials, and late millennials sub-groups will result in a more meaningful appreciation, understanding, and analysis of the results.

ABOUT THE RESEARCHERS

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