Modeling Gen Z Continuance Intention toward Ubiquitous Media System: Applying Technology Readiness and Technology Acceptance Model

Alaleh Dadvari and Ben-Roy Do

National Central University

Abstract

The move from traditional technologies such as desktop computing environment to ubiquitous media systems (UMS) including ubiquitous and mobile computing essential to analyze decision-making process in order to forecast and understand the continued use of multi-context UMS. As these applications provide easy access across multiple channels, it is of particular interest to explore factors that may affect the continuous intention toward UMS, particularly among generation Z. In this vein, continuous intention is a key indicator of long-term success for information system survival. This study proposed to employ the integrated model of technology readiness (TR) and technology acceptance model (TAM), as well as the mediation effect of technology acceptance model on continuance intention. Understanding the influential factors of continuance intention towards using UMS would assist policymakers to support programs on promoting information technology (IT). Using a sample of 261 adult consumers of ubiquitous media systems in Taiwan and SEM analysis, significant positive direct and indirect influences were found.

Keywords: Ubiquitous media systems, technology readiness, technology acceptance model, continuance intention, generation Z.

1. Introduction

Today's competitive technological progress in communication and services has extensively affected human life. Ubiquitous media system (UMS) refers to technologies providing users with digital multimodal content through ubiquitous computing devices (see Jacucci et al. [41]). This revolutionary human-computer interaction technology supports complex applications in different devices, such as laptop computers, mobile phones, tablets, and wearable devices. Indeed, the shifted paradigm where technologies become virtually invisible in our lives has created new opportunities for ubiquitous media system that encapsulates multiple functions across different platforms (see Carillo et al. [19], Zhang et al. [94]). Although ubiquitous access to the internet of things is opening up new ways of living, they also generate expected and unexpected consequences for society

and technology (see Ghose and Han [32]). For instance, despite the growth and potential benefits of this new form of technology products and services, such as new marketing opportunities for the business environment, some people choose to refuse and ignore their adoption (see Lam et al. [47], Mike and Fournier [58]).

Compared with older adults, young adults have high use rate of digital communication technologies, explicitly represents their sensitivity to new communication technology adoption and intention to use (see Lee et al. [49]). In this regard, marketers are required to respond to the trend of multi-generational marketing, that is, distinguish individual characteristics and intentional behaviors across generations, such as generation Y and generation Z (see Williams and Page [90]). Generation Y or Millennials are heavily influenced by digital environment (see Priporas et al. [68]), known to be prominent users of new technologies such as social media (see Balakrishnan et al. [8]). Generation Z, or Post-Millennials, are even more "embedded" with technology, as most of them have used the Internet since a young age, and are much more comfortable and insistence with ubiquitous media systems, besides having a desire to feel safe in the digital environment.

Generation Z are also characterized by their quick adoptions or switches to use other new technologies. This generation is more uniquely diverse from previous generations, as they behave differently which can lead to changes in consumer's behaviour (see Priporas et al. [68]). For instance, while Millennials pioneered Facebook, generation Z prefer different levels of privacy and anonymous across social media technologies. They have seen social misshapes of Millennials and do not want everlasting social footprint (see Taylor [79]). Therefore, given the competitive situation in the digital era, the ability to retain and motivate user's behaviour intention by considering individual characteristics could be an important concern for not only marketing decision makers, but also customer service industry. However, a Web of Science search conducted recently showed very limited studies on generation Z and their characteristics. What is even more challenging is the lack of studies conducted in Asia. Given that social media usage of millennials in USA is very different from Asian counties due to cultural differences (see Bolton et al. [17]), it is likely that user behaviour such as continuous intention to use ubiquitous media system may be different as well. For this reason, the current study purposely recruited Post-Millennials as target users of ubiquitous media system. In addition, understanding ubiquitous media system consumer behaviour is also found complicated as digital environment is progressing faster than ever (see Oulasvirta et al. [61]).

The value of technology is evidenced on how individuals adapt to new ways of doing things on new devices, such as wearable devices. During the past decade, several cases of Internet and related behavior disorders have made scientists aware of the role of primary psychological characteristics that should be recognized in consumers before facing new technologies (see Carillo et al. [19]). Furthermore, the contribution of technology innovation for consumers or organizations can only be successfully employed if it is widely accepted and diffused (see Beaudry and Pinsonneault [10], Van der Boor et al. [83]). Thus, gaining a deep understanding of what drives an individual's technology acceptance during decision-making process is important. To obtain technology benefits

besides initial adoption, continued use toward new systems are required (see Bhattacherjee [13], Limayem et al. [53]). In particular, sustainable success of technologies depends on the intentions to continue using the new systems (see Son and Han [74]). Given the rapid changes of products and improved features of services in digital environment, one of the most critical issues raised regarding computing devises is user's continuance intention of new system after initial adoption or discontinuance of that system (see Ku et al. [45], Yin et al [91]).

Continuance intention refers to the significant long-term consequences that indicate behavioral intentions toward using information system (see Bhattacherjee and Premkumar [15], Hu et al. [38]). It is considered to be a key driver of future behavior. Due to the rapid advances and multifaceted nature of UMS, a theory-driven investigation on the continuance intention, rather than user experience focusing on a specific device or application, may help us understand and develop better ubiquitous media system. A review of existing literature shows that technological readiness (TR) and user acceptance were used as antecedents of continuance intention for new technologies (see Walczuch et al. [87], Yin et al. [91]). However, little effort has been made to consider personality-based antecedents and cognitive dimension of technology acceptance on the continuance intention for ubiquitous media systems. Therefore, the present study proposed to employ the integrated model of technology readiness (TR) and technology acceptance model (TAM), as well as the mediation effect of technology acceptance variables on generation Z intentional behavior.

During the decision-making process, an individual's character is at the center of accepting the new technologies (see Chen [22], Chen et al. [23], Parasuraman [62]). Technology readiness combines multifaceted psychographic constructs that connects to the user's personal characteristics including optimism, innovativeness, discomfort, and insecurity for accomplishing goals. With technology acceptance model (TAM), it is assumed that perceived usefulness (PU) and perceived ease of use (PEoU) are central to influence individual attitude and behavioral intention toward using the technology (see Schepers and Wetzels [72]). Note that among the existing models to assess an individual's intention to use technology, TAM has been found with potential applications (see Davis [27], Lin et al. [54], and Oh et al. [59]).

The present study offers several contributions to the existing literature in the fields of information technology and management. Different from other studies, this paper is among the first to employ integrated technology readiness and acceptance model to measure continuance intention, particularly for a ubiquitous media system. From a theoretical perspective, one of the major contributions of this study is the development of theoretical model explaining and predicting Gen Z users' continuance intention. However, this study also strives to advance our knowledge on factors influencing continuance intention of Gen Z toward ubiquitous media system as a new and important stream of information system and management research. In other words, the study aims to contribute to service research and provide support for technology readiness and acceptance model as key factors to determine consumer continuance behavior for further research. From a practical perspective, realizing the influence of technology readiness associated

with technology acceptance model can offer deeper insight for decision makers to develop strategies to retain system users. Moreover, findings can be helpful not only to predict highly inclined system users, but also to provide a better practical application to motivate individuals toward continued usage in the future. The originality of the paper is the use of Lin et al.'s [54] integration of technology readiness and TAM as a technological lens in the setting of Taiwan. With the rise of ubiquitous computing, it provides an introductory view of post-millennial's attitudes towards continued use of these technologies.

2. Literature Review

2.1. Continuance intention

Understanding consumer intentions to continued adoption as well as usage of new technologies has been an area of high interest for last decades within management and information technology disciplines (see Benbasat and Barki [11], Karahanna et al. [44], Venkatesh et al. [85], Venkatesh et al. [86]). Continuance intention is defined as the measure of strength of individual's intention to behave constantly in a certain manner (see Bhattacherjee [12]). Adopting theory of planned behaviour (TPB), Karahanna et al. [44] proposed a primary model with three factors including attitude, subjective norms, and voluntariness to explain information system (IS) continuance. However, more factors were identified later on studies of continuance intention. For example, expectation-confirmation theory (ECT) originally proposed by Oliver [60] was applied by Bhattacherjee [12] to form information system continuance model, with emphasis based on usefulness and satisfaction (see Oliver [60]). Similarly, user's intention was addressed as the main indicator of IS continuance behaviour.

Studies about continuance intention of ubiquitous media system is rare. As of January 15, 2018, the only one available has relied on ECT to predict continuance intention (see Carillo et al. [19]). As noted by Amoroso and Lim [5], any factors that influence behaviour act as indirect influence through continuance intention which represents actual usage of technology or application.

2.2. Technology readiness

Technology readiness (TR) measures an individual's tendency to have and use new technologies, which comprises of four characteristics. Optimism relates to a positive view that technology will enhance control, flexibility, and efficiency in life (see Aboelmaged [1]). Innovativeness refers to the tendency to lead in using new technologies. Discomfort includes feeling inability to overcome fear of technology. Insecurity refers to distrusting technology for security and privacy reasons (see Walczuch et al. [87]). According to Parasuraman [62], individuals scoring high on positive side of TR and lower scores on dark side of it are more likely to apply a new technology (see Aboelmaged [1], Parasuraman [62], Walczuch et al. [87]).

Prior research on technology readiness found psychological characteristics are antecedents of cognitive dimension of TAM (see Agarwal and Prasad [2]). Furthermore,

some studies found a positive correlation between TR and perceived beliefs, such as the positive influence of TR on perceived service quality of Internet providers (see Lin and Hsieh [56], Zeithaml et al. [93]). Consequently, the integrated model of technology readiness and technology acceptance model (TRAM) was proposed by Lin et al. [54]. TRAM has been used to explain how personality dimensions can influence the way people interact with new technologies (see Lin et al. [54] and Oh et al. [59]). However, in a further study conducted by Walczuch et al. [87], significant correlation between technology readiness and dimensions of TAM (perceived usefulness and perceived ease of use) was found. Given that TAM is an adoption of the theory of reasoned action (see Ryan and Xenos [70]), where personality features can lead to beliefs related to the behaviour, besides following TRAM, it is proposed that:

H1a: Technology readiness is positively related to perceived usefulness of ubiquitous media systems.

H1b: Technology readiness is positively related to perceived ease of use of ubiquitous media systems.

H1c: Technology readiness is positively related to consumer's attitude about ubiquitous media systems.

2.3. Technology acceptance model

Davis [27] introduced technology acceptance model (TAM) and found that it could better explain user's acceptance (see Davis [27], Lee [50]). Indeed, TAM is a peculiar structure for predicting an individual's adoption of information technology, which posits that IT usage is a direct function of behavioural intention. In particular, TAM proposes that two specific beliefs, perceived usefulness (PU) and perceived ease of use (PEoU), are the primary drivers for attitude toward technology acceptance and IT usage (see Chiu et al. [25] and Lin et al. [54]). As described by Davis [27], perceived usefulness (PU) refers to the individual's perception on applying specific technology, and perceived ease of use (PEoU) is defined as the degree to which an individual believes using a particular system would be free of effort. Technology acceptance model illustrates the interrelationship between perceived usefulness and perceived ease of use, where PEoU as the determinant of PU. However, a review of the existing literature shows both PU and PEoU are affected by external variables such as user personality traits or social influence. Similarly, both PU and PEoU also can influence other factors (see Venkatesh and Davis [84], Zaremohzzabieh et al. [92]).

Attitude as the major predictor of behavioural intention towards actual usage is jointly determined by PU and PEoU (see Chiu et al. [25], Roca and Gagné [69]). Given the argument, perceived usefulness is suggested to be 50% more influential than perceived ease of use (see Davis [28]). Note that similar to TAM, theory of planned action (see TPB, Ajzen [3]) considers attitude as a central determinant of user's adoption intention. Attitude is conceptualized as psychological inclinations that represents personal judgment (see Ajzen [4]). The general finding using technology acceptance model suggests

external variables, such as personality characteristics, may be fully mediated by PU and PEoU, and both contribute to technology usage (see Devaraj et al. [30], Svendsen et al. [78]). Furthermore, sub-dimensions of TAM were generally found to influence each other (see Davis [27]). For instance, perceived usefulness may mediate perceived ease of use toward behavioural intention to use technology, and consequently adoption of services such as e-government (see Horst et al. [35]) and smartphones (see Joo and Sang, [42]). Accepting new technologies, a number of studies have demonstrated that PEoU significantly and positively influences PU (see Taylor and Todd [80], Venkatesh and Davis [84], Walczuch et al. [87]). Therefore, it is proposed that:

H2a: Perceived ease of use of ubiquitous media system is positively related to perceived usefulness of ubiquitous media system.

Perceived ease of use is found to be the other determinant of system intention. In other words, if a system is relatively easy to use, an individual will be more willing to learn about its feature (see Park et al. [66]). Studies revealed that there is a positive relationship between PEoU and behavioural intention. For instance, Wang et al. [88] found perceived ease of use is a significant antecedent of mobile banking. Therefore, it is hypothesized that:

H2b: Perceived ease of use of ubiquitous media system is positively related to consumer's attitude toward system.

As mentioned earlier, technology readiness is a combination of personality characteristics. Moreover, according to the theory of reasoned action, both PU and PEoU are beliefs that will affect user's attitude. These attitudes toward using the system will determine behavioural intention. Based on research applying TAM in a different context, perceived usefulness is positively correlated with attitude to use the system (see Baker-Eveleth and Stone [7]). For example, Horton et al. [36] confirmed the existence of the positive influence of PU on intention to use intranet media. Park et al. [66] asserted PU is positively associated with technology interest (see Park et al. [66], Park and Kim, [65]). Therefore, it is proposed that:

H3a: Perceived usefulness of ubiquitous media system is positively related to consumer's attitude to use the technology.

In IT literature, Bhattacherjee [13] proposed an expectation-confirmation model (ECM) of IT continuance. According to ECM, user's intention to continue IT usage depends on three variables such as satisfaction, confirmation, and post-adoption expectation, in the form of perceived usefulness. In line with expectation-confirmation theory, prior studies found individual perceived usefulness of new technology usage has a positive effect on intention to continue IT usage (see Lee [50]). Accordingly, based on the expectation-confirmation theory of information system, perceived usefulness is a significant predictor of user's continuance intention towards the system (see Chang and Zhu [20]). In fact, perceived usefulness has been addressed as a positive force on continuance usage intention in different contexts (see Bhattacherjee [13], Carillo et al. [19], Chang

and Zhu [20], Chaouali [21], Chiu and Wang [26], Hong and Tam [34], Hsiao et al. [37], Islam and Mntymki [40], Liao et al. [52], Roca and Gagné [69]). Therefore, the following hypothesis is proposed:

H3b: Perceived usefulness of ubiquitous media system is positively related to continuance intention to use the technology.

2.4. Consumer attitude toward technology

As discussed earlier, TAM is originated from the psychological theories of reasoned action and planned behavior, which has evolved to become a leading model for IS research in forecasting future behaviour towards adopting new technologies (see Marangunić and Granić [57]). In this regard, attitude toward using technology refers to an individual's overall affective reaction to using a system (see Venkatesh et al. [85]). According to Karahanna et al. [44], attitude can be positive or negative beliefs about a product or service. Prior studies within IT context, and based on technology acceptance model (TAM) have established users attitudes, and beliefs including perceived usefulness and ease of use, as the key determinants of both initial IT usage (acceptance) and long-term usage (continuance) (see Bhattacherjee [13] and Davis et al. [29]). It was found that any change in attitudes and beliefs will likely have a corresponding impact on, and may even reverse user's continuance intention and behaviour (see Bhattacherjee and Premkumar [15], Bhattacherjee and Sanford [14]). Prior research on information technology usage shows evidence of a strong relationship between attitude and continuance intention (see Amoroso et al. [6] and Black [16]). In particular, in terms of smartphone and mobile technologies, attitude was found significantly linked to continued intention and usage. Thus, it is proposed that:

H4: Consumer's attitude toward ubiquitous media system is positively related to continuance intention to use the technology.

2.5. Mediation of technology acceptance model

While previous research has studied the link between personality features and social media technologies on platforms such as Facebook and Twitter (see Hughes et al. [39], Legris et al. [51], Ryan and Xenos [70]), the emphasis was on the attitude and individuals beliefs towards the new technology, rather than whether the technology acceptance may influence continuance intention. As individual difference variables are known as the key to successful implementation of new technology, prior research found some personality traits to be related to specific beliefs about the perceived usefulness and perceived ease of use of technology (see Devaraj et al. [30], Svendsen et al. [78]), and its mediating effect on social media use (see Kwon and Wen [46]). In this study, we assume technology readiness as specific personality traits that can be influenced by perceived beliefs. More importantly, these beliefs can mediate the relationship between attitude and technology readiness. As mentioned there are interrelationships between TAM constructs. Therefore, the following hypotheses are proposed:

H5: Perceived usefulness of ubiquitous media system mediates the relationship between technology readiness and consumer's attitude to use the technology.

H6: Perceived ease of use of ubiquitous media system mediates the relationship between technology readiness and consumer's attitude to use the technology.

H7: Perceived ease of use of ubiquitous media system mediates the relationship between technology readiness and perceived usefulness of ubiquitous media system

H8: consumer's attitude towards technology mediates the relationship between perceived usefulness and continuance intention to use the technology

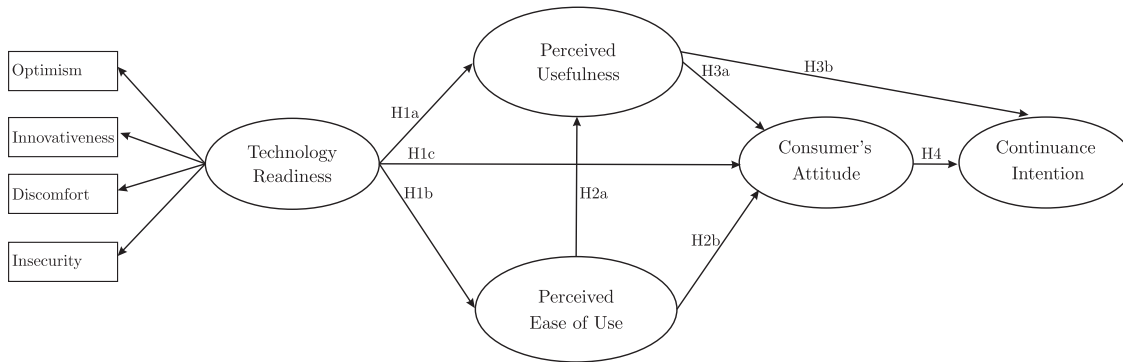The proposed research model is shown in Figure 1 below.

Figure 1: The proposed research model.

2.6. Generation Z (Post-Millennials)

Generation Z is consisting of people born between the mid-1990s to early 2000s. They are also known as Post-Millennial, The New Silent Generation, iGeneration, and Generation Me. Generation Z is the first generation to be raised entirely in the era of smartphone and social media platforms (see Bassiouni and Hackley [9]). What distinguishes this new generation from prior generations is Gen Z is the most electrically connected generation in the history (see Geck [31]). While digital media and information communication technologies are becoming increasingly embedded in young adults' everyday lives at a rapid pace, scholarly research within the context of social science such as consumer behaviour and marketing remains rare. The behavior of this generation can be considered unique. They grew up with laptops, mobile phones, and other electronic devices, which have become their characteristic accessories (see Samodra and Mariani [71]). It is argued that in comparison with earlier generations, behavioral shifts are being seen around the experience of this age group. For instance, generation Z is considered to have a high degree of autonomy as technology users. Besides the influence of family members, experience shared by other Post-Millennials are evaluated heavily during decision-making process toward using a service or product (see Bassiouni and Hackley [9], Thomson et al. [81]). Furthermore, perceived value is found to be an important

factor to them, and self-concept is partially determined by the sense of belonging to a certain age group (see Williams and Page [90]).

A review of existing literature throughout various disciplines shows that some studies tried to identify age group and the characteristics that set it apart from other generations (see Larson [48], Strauss et al. [75], Wiedmer [89]). Post-Millennials have experienced not only technology boom, but also social and political issues, such as the financial crisis comparable to the great depression. They highly prefer interacting with media, rather than passive technologies such as TV (see Wiedmer [89]). They are much less loyalty to a particular product, but are far more interested in higher expectations as well as personal experience. Moreover, their behavioral characteristics development is significantly shaped and influenced by diverse environmental and situational elements (see Turner [82]), which in turn may influence their behaviour intention.

3. Method

3.1. Data collection

Questionnaires were distributed to a total of 265 young adult consumers of ubiquitous media system in Taiwan during April and May 2017 that resulted in 261 useable responses. As explained earlier, the sample was intentionally set on generation Z, where many of them are undergraduate college students at the time. After removing five invalid responses, of the remained participants, there were 135 (51.7%) males, and 126 (48.3%) females. For the purpose of this study, the questionnaire was first pre-tested to ensure that questions were understood as intended. Among various ubiquitous computing devices, 43.7% participants strongly claimed that smartphone is their preferred device, followed by 32.1% on laptop-computing tools, and only 3.8% indicated tablet technologies. Among various ubiquitous media platforms, 57 % have shown highest intention to use Facebook as their preferred ubiquitous multi-context media platform, followed by YouTube, Instagram, Google, and Twitter, respectively. In general, the majority of respondents (24%) indicated that they use their devices for about 3 hours per day mainly for personal purposes.

A survey-based methodology was conducted through a self-administered questionnaire. The questionnaire contained 43 items representing the theoretical constructs and demographic information. Theoretical construct items were measured on a 5-point Likert scale, ranging from one (strongly disagree) to five (strongly agree). All of the items were translated from English into Chinese, and back-translated into English to ensure proper usage.

3.2. Measurement

The questionnaire consists of three scales adopted from prior studies. For the measurement of technology readiness (TR), 16-items from technology readiness index (TRI 2.0 scale) developed by Parasuraman [62] was used (Parasuraman and Colby [63]). Although the accuracy of TRI 1.0 among several research related to consumer's technology readiness has been empirically examined (see Lin et al. [54] and Walczuch et al. [87]), many formative technologies including smartphones, wireless internet services, social media, and cloud applications were in their infancy in 2000 (see Parasuraman and Colby [63]). Consequently, TRI 2.0 was adopted, with 4 items each for optimism, innovativeness, discomfort, and security sub-dimensions. Sample item includes "new technology contributes to a better quality of life." Cronbach's alpha coefficient of reliability for this construct was .807. Composite score was calculated by summing across items. The present study obtained an overall reliability alpha coefficient of .891.

To measure continuance intention, 3 items were adopted from the scale provided by Bhattacherjee [12]. The aim of the items used was to determine a user intention to continue using his/her ubiquitous media system devices. Sample item includes "I intend to continue using my smartphone rather than discontinue using it." Cronbach's alpha for this construct was .950.

Dimensions of technology acceptance including perceived usefulness, perceived ease of use, and attitude towards technology were measured using items adapted from Davis [27]. A total of 13 items were used to assess the level of technology acceptance using multimedia devices, with 5 items each for perceived usefulness and perceived ease of use, and 3 items for attitude towards it. Sample item includes "using smartphone in daily life improves my overall performance." The Cronbach's alpha coefficient for PU, PEoU, and attitude were .808, .808, and .823, respectively.

4. Result

Descriptive statistics and correlations are presented in Table 1. As expected, technology readiness correlated significantly with attitude, as well as with each construct of technology acceptance model. Attitude to use multimedia devices is significantly correlated with all other variables. Using item parceling, technology readiness was parceled into four sub-dimensions. As resulted final values for composite reliability and Cronbach's alpha exceed .7, representing satisfactory reliability and internal consistency after item parceling.

Composite reliability and validity are shown in Table 2. Convergent validity and discriminant validity were satisfactory. Construct validity indicates that measurement items are reliable to reflect the corresponding constructs. With CR > AVE, AVE > .5, MSV < AVE, and ASV < AVE, validation requirements have been achieved. Mentioning that acceptable threshold for construct reliability should exceed .7, and average variance extracted should exceed .5 (see Hair et al. [33]), besides statistical significance of each factor loading is confirmed by reaching the criteria of .5, this study met the general requirement of reliability and convergent validity of measurement model.

Table 1: Mean, Standard deviation, and correlation of study variables.

Variable	M	SD	α	1	2	3	4
1. Technology Readiness (TR)	3.320	.420	.807	-			
2. Perceived Usefulness (PU)	3.867	.692	.808	.94	-		
3. Perceived Ease of Use (PEoU)	3.423	.701	.808	.414**	.257**	-	
4. User Attitude (UA)	3.440	.813	.823	.253**	.292**	.451**	-
5. Continuance Intention (CI)	3.214	.886	.950	.271**	.219**	.410**	.348**

Note. $N = 261$. $*p < .05$. $**p < .01$.

Table 2: Composite reliability, convergent validity, and discriminative validity.

Variable	CR	AVE	MSV	ASV
1. Technology Readiness (TR)	.950	.865	.317	.150
2. Perceived Usefulness (PU)	.810	.519	.205	.086
3. Perceived Ease of Use (PEoU)	.774	.533	.317	.219
4. Users Attitude (UA)	.790	.558	.471	.155
5. Continuance Intention (CI)	.818	.604	.471	.266

Structural equation modeling using maximum likelihood estimation in AMOS 22.0 was employed. For evaluation of model fit, Chi-square statistic (χ^2), χ^2/df ratio, root mean square error of approximation (RMSEA), and comparative fit index (CFI) were used (Shook et al. [73]). The initial measurement model showed moderate fit (χ^2 = 222.508, df = 95, CMNI/DF = 2.367, CFI = .943, RMSEA = .073, and NFI = .906). However, by removing an item from perceived usefulness, and an item from perceived ease of use of multimedia device, the measurement model demonstrated better statistics, with χ^2 = 33.925 (df = 16), CMNI/DF = 2.120, CFI = .969, NFI = .945, and RMSEA = .066, suggested a significantly adequate and sufficient fit to the data. Literature shows that a good model fit for a structural model is represented by ratio of χ^2 to the degree of freedom smaller than 5.0, CFI, NFI values larger than .9, and RMSEA value smaller than .08 (see Hair et al. [33]).

H1 hypothesized that technology readiness for more advanced and newer technologies is positively related to technology acceptance of UMS devices, in terms of perceived usefulness of this type of UMS devices (H1a), perceived ease of use of UMS (H1b), and consumer's attitude to use UMS (H1c). H1a (β = .643, z = 3.688, $p < .001$), H1b (β = .972, z = 6.873, $p < .001$), and H1c (β = .354, z = 2.410, $p < .05$) were all supported. H2 tested the relationship among components of UMS technology acceptance, where H2a tested PEoU of UMS devices on PU as the most preferred device (β = .333, z = 4.162, $p < .001$), H2b tested PEoU of UMS on consumer's attitude to use advanced future technologies provided by UMS (β = .343, z = 5.166, $p < .001$). H3a tested PU of UMS devices on individuals attitude to use it for new technologies (β = .133, z = 2.511,

$p < .05$). Similarly, H3b tested if PU of UMS is positively linked to continuance intention to use it ($\beta = .149$, $z = 3.063$, $p < .05$). Consistent with previous studies, H3 series of hypotheses were fully supported. H4 proposed consumer s attitude towards UMS devices is positive related to continuing intention to use the system ($\beta = .595$, $z = 10.51$, $p < .001$) was supported as well. The result of hypothesis testing for direct path is shown in Table 3.

Table 3: Hypothesis testing for direct path.

Path	Estimate	C.R.	p	Result
PU⟵TR	.643	3.688	.001	H1a: Significant
PEoU⟵TR	.972	6.873	.001	H1b: Significant
CA⟵TR	.354	2.410	.016	H1c: Significant
PU⟵PEoU	.333	4.162	.001	H2a: Significant
CA⟵PEoU	.343	5.166	.001	H2b: Significant
CA⟵PU	.133	2.511	.012	H3a: Significant
CI ⟵PU	.149	3.063	.002	H3b: Significant
CI ⟵CA	.595	10.51	.001	H4: Significant

Table 4: The results of bootstrapping in testing the mediation effect (Unstandardized indirect effect).

Path	Estimate	p	Result	Type of Mediation
CA⟵PU⟵TR	.462	.001	H5 : Significant	Partial
CA⟵PEoU⟵TR	.044	.044	H6: Significant	Partial
PU⟵PEoU⟵TR	.324	.005	H7: Significant	Partial
CI⟵CA⟵PU	.079	.048	H8: Significant	Partial

Hypotheses 5 to 8 deals with the mediation effect of UMS devices technology acceptance, as well as the indirect effect of the PU on the outcome variable (i.e., continuance intention) that goes through the mediator. Using the traditional approach without mediation, the direct effect of technology readiness towards consumer's attitude to use UMS devices was significant ($\beta = .818$, $p < .001$). However, after adding PU of social media into the model, the beta coefficient dropped to $\beta = .618$ ($p < .001$), yet the path coefficient from technology readiness towards consumer's attitude to use smartphone devices remained significant. This suggests the indirect path was significant, and H5 was supported. Similarly, adding PEoU into the model showed $\beta = .437$ ($p < .05$), and H6 was supported as well. Consistent with studies investigating the interrelationship among technology acceptance constructs, perceived ease of use could partially mediate the relationship between technology readiness variable and the perceived usefulness of using

the system. Findings show that beta coefficient has reduced from $\beta = .344$ to $\beta = .179$ $(p < .001)$ and H7 was supported.
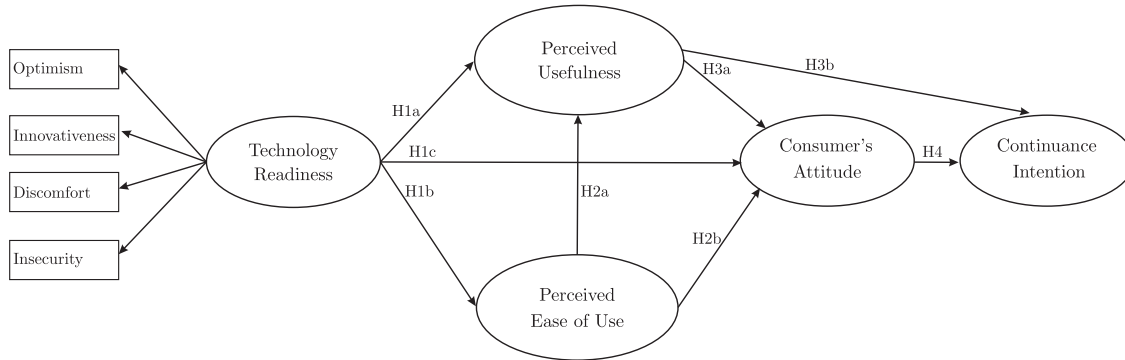

Figure 2: Structural equation model (unstandardized coefficients).

Finally, whether the effect of perceived usefulness about UMS devices on continuance intention to use the system is influenced by the mediation of consumer's attitude was tested. Results indicated that beta coefficient has dropped from $\beta = .354$ to $\beta = .149$ $(p < .05)$, and H8 was supported. The significance of the mediating effect was tested using the bootstrap estimation procedure. To confirm mediation, bootstrap confidence interval provides the best estimation in testing for mediation effect (see Cheung and Lau [24]). Bootstrapping describes a nonparametric approach to hypothesis testing that makes no assumption about the shape of the distribution of the variable, and provides the true estimation of the indirect effect (see Preacher and Hayes [67]). Additionally, in this study using 3000 bootstrap samples with 95% confidence interval for mediating path did not involve a zero, which approved the significance of mediating effects. The unstandardized indirect path coefficient is displayed in Table 4, and the structural equation model is shown in Figure 2.

5. Discussion and Conclusion

The major transformation of information technology has generated a demand to revisit the concept of mobile devices usage through the lenses of theories that encompasses the multi-faced nature of ubiquitous media system. In addition, mobile telecommunication technologies have evolved into a complex ecosystem including social media networks, mobile application, and services. This rapid transformation of technologies has created a new form of connected IT artifact, ubiquitous media systems, that allow users to complete multitasking in daily life (see Carillo et al. [18] and Lin et al. [55]). Despite this revolutionary trend and potential benefits of this new form of technology products and services, some people choose to refuse, and ignore their adoption (see Lam et al. [47], Mick and Fournier [58]). In particular, technology users have seen shifting intentional behavior toward using different systems. Moreover, digital ecosystem leaders need to take better strategic decisions based on consumer's intentions. Thus, given the important role

of ubiquitous media systems, it is sensible to gain a deeper insight into the factors that drive individuals' technology acceptance during the decision-making process.

Contributing to the existing literature of ubiquitous media systems, our study is among the first that considers integrated technology readiness and technology acceptance model to analyze continuance intention-behavior. Drawing upon previous findings, this current study developed a conceptual research model and empirically tested several hypotheses about the influence of smartphone technology acceptance as a type of ubiquitous media system on the relationship between technology readiness and continuance intention toward using it in the future. As different generation cohort represents a different set of behavioural characteristics that may be widely contributed and influenced by situational factors, this study highlights generation Z. Comparing to previous generations, they are more interested in interactive media technologies. Therefore, predicting continuance intention of this age group will have multi-disciplinary contribution for the society. Responding to the request toward a better understanding of ubiquitous media system, this study provides a contribution to information technology as well as technology management literature.

Several managerial implications can be obtained from this study. First, by combing integrated technology readiness and technology acceptance, this paper investigated the role of psychological perception of generation Z consumers who adopt smartphone technologies in predicting intentional behaviour to use ubiquitous media systems. Results confirmed that integrating the psychological construct of technology readiness into technology acceptance model evidently increased the precision of the proposed model in shaping and predicting generation Z consumer's intentions. Second, findings have revealed that perceived usefulness of UMS devices, as well as perceived ease of use of the system, both can positively and significantly mediate how technology readiness related to consumer's attitude. This is consistent with research findings that show the mediating role of value perception toward interacting behavior with social media networks (see Davis et al. [29], Sun and Zhang [76]). Third, findings of the model showed that technology readiness is significantly associated with intention to continue using UMS devices. In addition, perceived usefulness, perceived ease of use positively affects continuance intention to use ubiquitous media system through the mediating effect of consumer's attitude. In parallel with TAM studies, results represented that perceived usefulness is a critical determinant of intentional behaviours, and perceived ease of use has both direct and indirect effect through perceived usefulness and on individual's attitude toward system usage. Finally, technology readiness was found to be as an antecedent of both perceived usefulness and perceived ease of use of UMS, which simultaneously influence user's attitude toward system usage. It is found that the level of technology readiness toward UMS inflates positive attributes about the system. Furthermore, findings suggested that continuance intention to UMS is jointly determined by the individual's attitude toward multimedia devices and perceived usefulness that are in line with studies presenting usefulness, and attitude as the determinants of continuance intention (see Lee [50], Sun et al. [77]).

The current study has a few limitations that can be opportunities and direction for future research. One potential limitation might concern the context of the research that was conducted in Taiwan, which puts some restrictions on the generalizability of the results. Although the questionnaire was originally developed in English, translated into Chinese and back-translated to ensure proper meaning, future research could explore possible cultural differences. Second, it is essential to remind that this study focused on only one type of device, in particular smartphones.

Thus, to generalize the findings for other devices, further studies are needed. This present study did not consider the divergence between voluntary and mandated usage. Therefore, further development and evidence from integrated technology readiness and technology acceptance model in different service environment are required. Moreover, as the data was collected using self-report questionnaire, common method variance may be of concern. Importantly, studies using survey method should ensure that respondents avoid bias to survey statements. Finally, investigating intentional behaviour may need longitudinal research, which is usually ignored by previous research. However, the accelerating change that is referred to the perceived increase in technology growth may be another factor that can positively or negatively affect the relationship among research variables.

Since this study investigated the factors that construct the strong and positive relationship between ubiquitous technologies and continuance inclination of users, from the practical standpoint results can provide a deeper insight for service providers and digital ecosystem leaders to adjust their products or develop strategies retaining system users in order to gain sustainable success. Concerning that, this study shed light on some important psychological differences who hold dissimilar beliefs about usefulness and ease of use of ubiquitous media systems. While technology acceptance model suggests consumer's attitude toward technology is the outcome variable resulted by perceived usefulness and perceived ease of use, which ultimately leads to intentional behaviour of technology users. This is essential for positions and job environment where using a collaborative system is important. In fact, organization or departments such as marketing, and customer service could benefit from individuals having a high level of technology readiness and positive attitude toward continuance using technology.

A final implication might arise from individuals facing UMS technologies as external motivation in decision-making process toward continuance usage. Understanding technology readiness as different psychological characteristics and how they perceive new technologies can lead to better change management strategies. As the partial mediation role of ubiquitous media systems has been found, this gives a new direction for future studies to realize technology readiness and distinctive characteristics involved during modeling behavioral intention toward using specific technologies. Furthermore, regarding the level of technology acceptance among individuals, policymakers can better understand and motivate individuals toward continuing system usage.

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Department of Business Administration, National Central University, No. 300, Zhongda Rd., Zhongli District, Taoyuan City 32001, Taiwan (R.O.C.)

E-mail: ala.dadvari@gmail.com

Major area(s): Human resource management, entrepreneurship, computer and human behavior.

Department of Business Administration, National Central University, No. 300, Zhongda Rd., Zhongli District, Taoyuan City 32001, Taiwan (R.O.C.)

E-mail: benroydo@gmail.com

Major area(s): Managerial psychology, organizational behavior, human resource management.