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RESEARCH ARTICLE

Mobile phone-enabled internet services and the technology readiness of the users

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Abstract: At a time the ecosystem of mobile phones continues to evolve, this study investigates the impact of the users' technology readiness (TR) and perceived value (PV) of mobile phone-enabled internet usage (MPEIU). The primary aim of this study is to examine the potential roles of TR and the dimensions of PV as antecedents of mobile data usage and to contribute to the debate on the determinants of technology acceptance and usage by individuals. The perceived value of mobile phone-enabled internet is conceptualised under five dimensions, viz: (1) utilitarian value, (2) hedonic value, (3) uniqueness value, (4) epistemic value, and (5) economic value, in a survey conducted by using a validated questionnaire, with a sample of 550 adult mobile phone users in the Central Province of Sri Lanka. The data analysis employs covariance-based structural equation modelling (CB-SEM) analytical process and the findings reveal that their adoption intention (AI) has a direct positive influence on the MPEIU. It is discovered that the utilitarian, epistemic, and hedonic value dimensions of MPEIU indicate a direct influence on their AI while TR indicates an indirect influence on it. The findings imply that the generic strategic approaches (i.e., cost and differentiation) to mobile internet services may be an ineffective solution and suggest that the focus should shift towards improving the utilitarian, epistemic, and hedonic components of mobile internet services. Accordingly, the users with a higher level of TR indicated an affinity to have a higher AI and higher usage. Therefore, the user's TR is recommended here as the basis for market segmentation.

Keywords: Mobile internet, technology use, perceived value, technology readiness.

INTRODUCTION

The entire spectrum of the mobile phone ecosystem has been changed due to the inclusion of data transmission facilities to cellular phones (Vriendt, *et al*., 2002). In addition, internet access has brought an unlimited potential to the services offered through a mobile phone. For example, in 2003, Blackberry, a leading mobile phone manufacturer, managed to capture the executive market by introducing a phone with access to email services.

Enhancing data transmission capabilities targeting a better service in terms of internet access has become a primary focus of the development agenda of the mobile industry (Lee, 2014). As a result, mobile service providers have diversified their service mix by blending innovative new types of services with the traditional ones. These value-added services have become a significant source of income (Kuo & Yen, 2009) for mobile service providers and created a platform for gaining a competitive advantage through service differentiation (Cricelli *et al.*, 2011).

Mobile phones have become a ubiquitous device used by the majority of people. However, during the early stages of the mobile industry, the facilities were only available in the highly urbanised regions of the developed

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countries. Mobile technologies become ubiquitous due to technological inventions, which enable the transmission of large volumes of mobile data to long distances. On top of these, the reduction of mobile devices and data transmissions costs has enabled a significant portion of the population to use mobile phones.

The overwhelming popularity of the mobile technologies has made the mobile service providers (MSPs) focus on selling new connections to the potential customers as a premier growth strategy. However, due to the intense competition and diminishing number of the potential customers within the market, none of the MSPs could maintain the growth levels they aimed at. Therefore, increasing the earnings from the existing connections emerged as an alternative growth strategy (Genakos & Valletti, 2012). The mobile data stand the most essential component in the mobile service mix and that can significantly impact the earnings from the connection. Therefore, theorising the antecedents of the mobile data usage would be critical in explaining why or why not an individual uses the service. Such studies would generate valuable knowledge for MSPs regarding the increase of their earnings by persuading their existing customer base to consume more services (Xu *et al*., 2015).

The rest of the paper continues as: the literature review, the research hypotheses, the conceptual framework followed in the research design, findings together with the conclusions & implications, and future research directions.

LITERATURE REVIEW

Investigating the determinants of technology acceptance by individuals is regarded as a popular research area with an extensive literature base. However, the existing literature indicates many under-investigated areas. Therefore, this section reviews the existing literature and the research gaps addressed in this paper. After that, the research hypotheses are presented together with the theoretical underpinnings. Finally, the conceptual framework that has been derived through synthesising all the research hypotheses is presented at the end of the section.

Depending on the target users, the technologies are broadly categorised into two: (1) organisational context and (2) consumer context (Venkatesh *et al*., 2012). The existing literature base is skewed towards organisational technologies since most researchers have investigated the acceptance of such technologies. Consequently, many researchers on the use of technologies in the consumer context have utilized the theories developed for the organisational context. However, considering the apparent differences between the two contexts, it would be equally important to study and understand the user acceptance process of the technologies within the consumer contexts (Venkatesh *et al*., 2012; Wang & Lin, 2012; Woodruff, 1997; Xu *et al*., 2015).

It is also evident from the literature that having developed technologies and made them available for potential users may not necessarily assure the use of such technologies (Wang & Lin, 2006; Xu *et al*., 2015). Usage rates lower than the forecasted are a common claim related to pay-per-use technologies such as mobile internet. This study has attempted to explore the determinants of MPEIU so that the generated knowledge could be used in formulating strategies to improve the usage rates.

Moreover, Parasuraman (2000) states that a potential reason for having lower technology usage rates despite the ubiquitous availability of the required infrastructure and other facilities, could be the lack of consumer (user) readiness. Only a few researchers have attempted to investigate this relationship, especially in mobile technologies. The association between TR and PV has also not been sufficiently studied in the existing literature, leaving a considerable knowledge gap (Yieh *et al*., 2012).

Therefore, the paper attempts to address the existing knowledge gaps by investigating the impact of the users' TR on the MPEIU and the dimensions of PV. The paper also examines that the impacts of PV and TR on technology usage may vary with cultural and demographic factors. Therefore, a study of this nature from a less researched cultural background like Sri Lanka would complement the existing knowledge base.

Users' perceived value

Kim & Han (2009) indicates the consumer's perceived value as one of the most significant determinants of his or her adoption intention. PV is generally defined as a trade-off between total benefits and total sacrifices, where these sacrifices could be either monetary or non-monetary, or both (Kim *et al*., 2009; Kim & Han, 2009). However, most of the research in the existing literature has conceptualised PV as a single dimension despite its multidimensional nature (Al-Debei & Al-Lozi, 2014; Berraies *et al*, 2017; Wang *et al*., 2019). Therefore, the existing knowledge base shows an inadequacy in explaining the influence of the dimensions of perceived value on the use of technologies in the consumer context. In contrast to most studies (Xu *et al*., 2015), this research divides PV into five constructs, and the impact of each

construct on each individual type of impact on each technology usage has been studied.

Al-Debei & Al-Lozi (2014) conceptualise five dimensions of PV, namely: (1) utilitarian value, (2) hedonic value, (3) economic value, (4) uniqueness value, and (5) epistemic value. The utilitarian value is defined as "the extent of effectiveness and efficiency perceived by consumers when using information systems" (Kim *et al*., 2009). Utilitarian value considers objective factors such as the functionality and economy of a technology (Ozkara *et al*., 2017; Shi *et al.* 2017). The existing literature provides evidence of this factor as a significant determinant of adoption intention and use (Kim & Han, 2009; Shi *et al*., 2017).

The hedonic value is defined as the level of pleasure and joy users experience when using a certain technology (Al-Debei & Al-Lozi, 2014). It is argued that the perception of hedonic value depends on the successful delivery of fun and enjoyment (Rintamäki, *et al.*, 2006) receives from the services such as mobile internet. The users of the technologies are expected to have pleasurable sensations through their sensory channels (Igbaria *et al*., 1995). On the other hand, the uniqueness value refers to the sense of differentiation or distinctiveness from others (Tian & McKenzie, 2001). Al-Debei & Al-Lozi (2014) points out that owning or using a unique product or service may generate a perception of dominance and leadership in the social structure. Individuals also use mobile devices to indicate a distinctive social image (López-Nicolás *et al*., 2008). However, it is also noted that when a product or service gets popular, the uniqueness attached to it tends to diminish (Al-Debei & Al-Lozi, 2014).

The epistemic value is defined as the knowledge gained upon trying new things (Pihlström & Brush, 2008). It is widely believed that when a service becomes more innovative, the consumers may adopt it more, indicating a positive impact on the usage intention (Al-Debei & Al-Lozi, 2014). The economic value is defined as the gap between the value perceived from using the mobile internet and monetary sacrifices (Heinonen & Andersson, 2003). Many researchers identify the economic value as a significant determinant of a technology used, especially while adopting technologies in the consumer contexts (Raman & Don, 2013; Venkatesh *et al*., 2012).

Users' Technology Readiness

Parasuraman (2000) defines the TR as people's propensity to embrace and use new technologies for accomplishing goals in home life and at work. Although TR is regarded as a determinant of a "person's predisposition to use new technologies" (Parasuraman, 2000), TR neither represents a measurement of technical competence nor knowledge of technologies. To measure the users' TR, Parasuraman (2000) develops a measurement instrument called the technology readiness index (TRI), and this study adopts have the updated version of the measurement instrument (TRI 2.0) in Parasuraman & Colby (2014).

Since its inception, TR has been used as a construct in various types of research. For example, Borrero *et al*. (2014) study the role of TR as a moderating variable in the expressive participation in the internet social movements. Sunny *et al*. (2018) look at the impact of cultural values on technology acceptance. Ismail *et al*., (2013) investigate the pedagogical use of mobile phones and their impact on TR. However, only a few studies investigate the possible effect of TR on PV. Yieh *et al*. (2012) are among those few that confirm the existence of such an effect. This research investigates the available knowledge gap by conceptualising the possible effects of TR on the dimensions of PV.

RESEARCH HYPOTHESES

Based on the literature review, six hypotheses resembling the intervariable associations were formulated. The evidence suggests that certain demographic factors may strongly influence certain particular individuals' TR (Rojas-Méndez *et al*., 2015; 2017). Therefore, considering the possible impacts of their demographic characteristics on the relevant users' TR, the following broad hypotheses are formulated:

> Null hypothesis 1: H1: The users' technology readiness is equal across all the groups under each demographic factor.

In line with the previous studies (Erdoğmuş & Esen, 2011; Parasuraman & Colby, 2014), this study proposes null hypothesis 2 and null hypothesis 3 considering the potential effects of TR on the intention of mobile phone enabled internet services and mobile phone enabled internet usage.

> Null hypothesis 2: H2: There is no direct effect from the users' TR on the adoption intention of mobile phone enabled internet services.

> Null hypothesis 3: H3: There is no direct effect from the users' TR on mobile phone enabled internet usage.

The literature further reveals that most studies on technology acceptance recommend the use of adoption intention (AI) instead of actual usage (behaviour). They believed in the notion of having a strong positive relationship between AI and actual usage (Hsu & Lin, 2015; Wang & Lin, 2006). In the existing literature,

empirical evidence to prove this notion is rare. Therefore, this study measures both AI and actual usage. Further, it empirically tests the association between adoption intention and technology usage:

Null hypothesis 4: H4: There is no direct effect from the adoption intention of mobile phone enabled internet services on mobile phone enabled internet usage.

The existing literature conceptualises PV as a determinant of technology usage (Lin *et al*., 2020). In addition, PV is found to indicate the characteristics of a mediating factor for some determinants of both AI and technology usage (Wang *et al*., 2020). However, it is yet to understand the individual roles of the dimensions of perceived value within the technology adoption process. Further, a potential association between the users' TR and PV has been predicted in the existing literature (Yieh *et al*., 2012). However, empirical evidence of such an association is rare in the existing literature (Bandara & Jayawardena, 2019; Yieh *et al*., 2012). Therefore, null hypotheses 5 and 6 are formulated to identify the mediation effects of the users' TR on their adoption intention of mobile phone enabled internet services and mobile phone enabled internet usage. These two hypotheses would capture all the notions mentioned above.

Null hypothesis 5: H5: The effect of the users' TR on the adoption intention of mobile phone enabled internet services is not mediated by the dimensions of perceived value.

Null hypothesis 6: H6: The effect of the users' TR on mobile phone enabled internet usage is not mediated by the dimensions of perceived value.

Conceptual Framework

Figure 1 illustrates the conceptual framework of the study, along with the research hypotheses discussed. The respective code number of each hypothesis is presented next to each arrow. The dotted lines and the arrows represent the mediating effects of the dimensions of the perceived value of the association between TR, AI, and MPEIU.

METHODOLOGY

In line with the suggestions of Neuman (2014), the sampling strategy, data collection techniques, measurement of the variables, and statistical techniques deployed in the study are presented in this section.

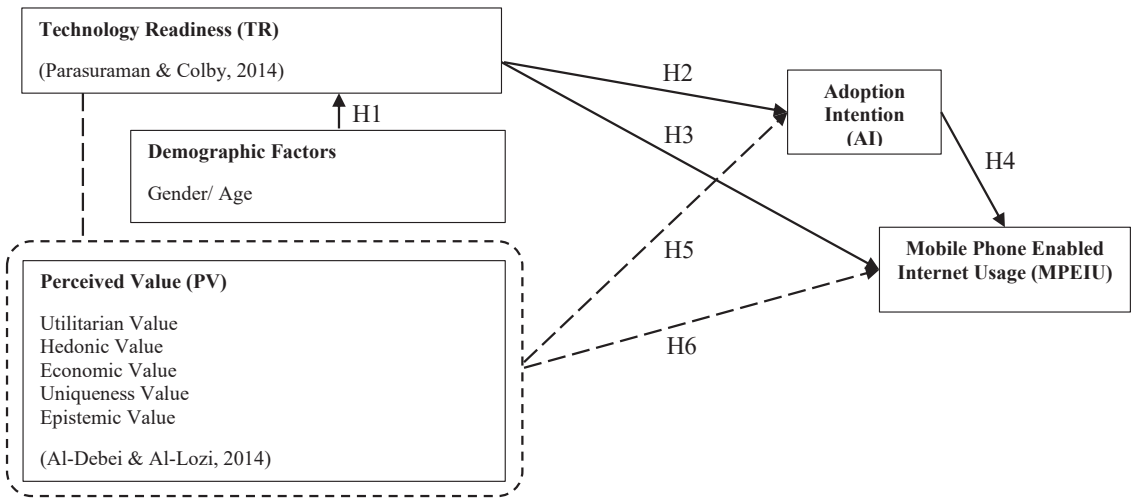

Figure 1: Conceptual framework

Study population

The study involved a group of adult (above 18 years) mobile phone users in Sri Lanka. However, the focus was narrowed down to the Central Province of Sri Lanka due to the following reasons: (1) The mobile phone penetration rate of the Central Province is reported to be the closest value to that of the country, and it is also reported to be the median value among the other provinces. (2) The residents' profile of the province is represented by all the major groups of the country's population (Sri Lanka, Central Bank of Sri Lanka, 2018).

Sampling Strategy

In conducting the research, a multistage cluster sampling technique was applied based on the administrative structure of the Central Province of Sri Lanka which is divided into the three districts: Kandy, Matale, and Nuwara Eliya. The districts are further divided into several Divisional Secretariat Divisions (DSD), each of which constitutes several Grama Niladhari Divisions (GND). Thus, on the whole, the province is divided into 2224 Grama Niladhari Divisions (GND). The three stages of the cluster sampling strategy and their justifications are as follows.

During Stage 1 of the sampling process, the DSDs of which the populations are not representative of all the sectors (i.e., urban, rural, and estate) were not considered for the data collection process. Thus, six DSDs from the Kandy district and two each from the Mathale and Nuwara Eliya districts were chosen under stage 1 of the sampling process. During the stage 2, each district was allocated with a quota of GNDs proportionate to the adult population. After carefully considering the time and cost constraints, 10 GNDs were assigned to the Matale district as a base value since it had the lowest adult population and, thus, the lowest quota among the three districts. Consequently, a total of 55 GNDs were selected (Table 1) by proportionating the lowest quota to other districts.

In stage 3 of the sampling, ten respondents from each selected GND were identified using the purposive sampling technique. The selected sample of 550 mobile phone users were in line with the guidelines given by Krejcie & Morgan (1970) which indicate that for a sample populations size above 1,000,000, the sample should consist of at least 384 units at a confidence level of 95% with an error margin of 5%. Moreover, this satisfies the requirements of the covariance-based structural equation modelling (Hair *et al*., 2011).

Research Instrument

The Users' TR was measured after obtaining a written permission, using "The Technology Readiness Index 2.0 (TRI 2.0)", authored by Parasuraman & Colby (2014). The scale developed by Al-Debei & Al-Lozi (2014) was adopted to operationalise the five dimensions of PV. In addition, the scale developed by Davis (1989) was employed to measure the adoption intention. All these measurement scales used a 5-point Likert scale.

As per the directions of Davis (1989), time spent on technology usage was used as an indicator of the technology usage. In addition, a filter question was used to distinguish the responses of the mobile internet users from those of the non-users. Finally, inclusive of all these scales, a questionnaire was developed.

Translation of the questionnaire

The questionnaire was translated into the native languages of Sri Lanka (Sinhala and Tamil). The translation process followed the traditional forward and backward approach (Degroot *et al*., 1994) to ensure the same meaning in all three languages. Then it was tested for the reliability of the items. The results indicated that Cronbach's Alpha values for all the latent variables are higher than 0.7, indicating a reliable survey instrument.

Analysis techniques

This study investigates the causal relationship between a set of variables, employing covariance-based structural equation modelling (CB-SEM) as the primary data analysis technique, under which the CB-SEM analysis was carried out, using AMOS version 23.

Table.1: GND Quota per district

District	Number of GNDs
Kandy	30
Matale	10
Nuwara Eliya	15
Total	55

RESULTS

Sample demographics

From the selected sample of 550 adult mobile phone users, 522 responses were retained for the analysis after removing the incomplete responses. There were 258 responses from the males and 264 responses from the females. The education profile of the respondents reveals that 371 respondents have at least passed the GCE Advanced Level examination, while 22 have educational qualifications below GCE Ordinary Level. The employment profile of the sample reveals that 109 of the respondents are unemployed, 34, self-employed, and the rest employed only during the time of the data collection.

Effect of gender on users' TR

The results of the independent sample t-test reveals that there is no significant gender-based difference between the users' TR scores (t= 1.411, p=0.159). Thus, it concludes that gender does not have a significant effect on the users' TR level.

Effect of age on users' TR

Between the different age groups, the highest TR score of 3.1 is reported against the age group 18 – 25 years, while the lowest value of 2.8, by the age group 56 – 65 years. The results of the ANOVA to test the TR mean differences between the age groups reveal that the TR scores are significantly different among the age groups ($F=8.323$, $p \leq 0.001$). Thus, it is evident that the TR level of the respondents significantly varies in accordance with their age.

Results of confirmatory factor analysis

Prior to testing the inter-relationships among the variables, the uni-dimensionality, validity, and reliability for each latent variable is confirmed using a confirmatory factor analysis (CFA). The factor loadings of the items of each latent variable and correlations between each pair of latent variables are illustrated in Figure 2. All the standardised factor loadings are significant and higher than 0.5. Therefore, it is concluded that the uni-dimensionality of the measurement model is within the accepted level (Kose & Demirtasli, 2012). Moreover, the AVEs for all the latent variables indicate values higher than 0.5, confirming an adequate level of convergent validity. It is also evident that each latent variable's Cronbach's Alpha value is higher than 0.7, and the CR value of each dimension is higher than 0.7. Thus, the measurement model indicates an adequate level of internal consistency reliability (Hair & Sarstedt, 2012; 2013; Nunnally & Bernstein, 1994; Sarstedt *et al*., 2004). The square root of the AVEs is larger than the squared correlations between the constructs indicating an adequate level of discriminant validity for the constructs used in the model.

The model fit criteria, as per the guidelines of Hu & Bentler (1999) are presented in Table 2. All the fit Table 2 indicators of the CFA model are within the acceptable

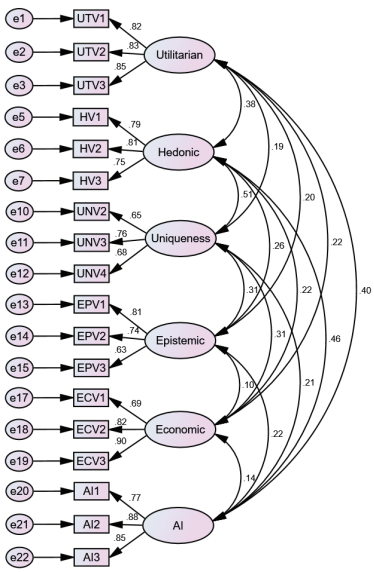

Figure 2: CFA Model – with all latent variables and retained items from CFA

range. Therefore, the model indicates an adequate level of model fit under all categories.

Results of structural equation modelling

The CFA phase of the analysis confirms the uni-dimensionality, validity, and reliability of the measurement model, and the SEM phase of the analysis. First, an SEM model is formulated with all the paths between TR, dimensions of PV, adoption intention (AI), and mobile phone enabled internet usage (MPEIU) (Figure 3). Then, both TR and MPEIU are included in the model as observed variables, and dimensions of PV and AI are indicated as latent variables with factors identified under CFA.

Standardised regression weights and their significance indicate that none of the variables has any significant associations with MPEIU. Only TR, hedonic value, and utilitarian value indicated a significant positive association with AI. In addition, only the utilitarian, uniqueness, and epistemic values have significant positive associations with TR.

Table 2: Model fit criteria for the CFA model

Model Fit Category	Index	Level of Acceptance	Value for the CFA Model
Absolute fit	Root mean square of error approximation (RMSEA)	RMSEA < 0.08 (Browne & Cudeck, 1992)	0.073
	Goodness of fit index (GFI)	GFI > 0.90 (Joreskog & Sorbom, 1986)	0.908
Incremental fit	Comparative fit index (CFI)	CFI > 0.90 (Bentler, 1980)	0.922
	Tucker-Lewis index (TLI)	TLI > 0.90 (Bentler & Bonett, 1980)	0.900
Parsimonious fit	Chi-square/degrees of freedom (Chisq/df)	Chisq/df < 5.0 (Marsh & Hocevar, 1985)	3.163

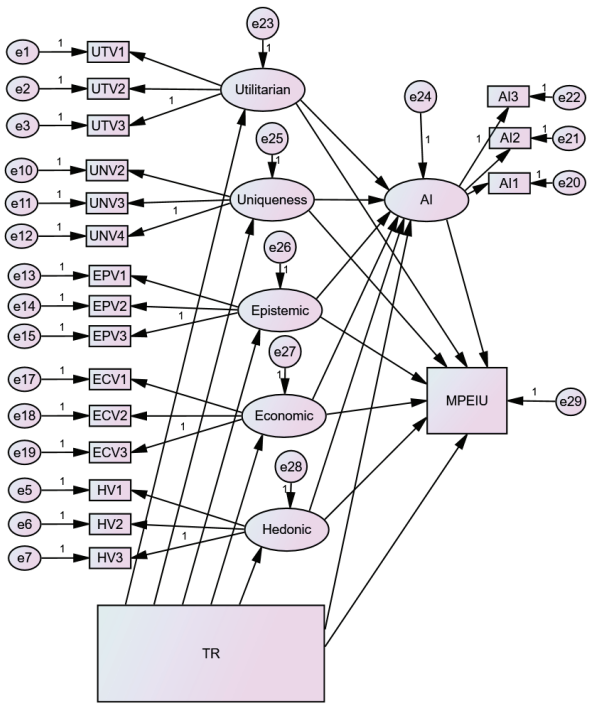

Figure 3: SEM model 1

The model-fit criteria for the SEM model 1 indicates that the model does not have an adequate model fit since all the criteria except parsimonious fit indicate values outside the acceptable range. Therefore, in line with the previous literature, the non-significant paths are eliminated one at a time, from the model, and the significant paths and model fit indices for each model are investigated. The process continues until a structural model with an adequate model fit and all significant path coefficients is identified. The final structural model obtained after this process is presented in Figure 4 below.

The results of the CB-SEM on the new model indicate that both the RMSEA (0.069) and GFI (0.931) values are within the level of acceptance, indicating an adequate level of absolute fit. Further, the model indicates an adequate level of incremental fit since both the CFI (0.939) and TLI (0.922) values are within the acceptable range. Furthermore, the Chisq/df value (2.956) is within the acceptable range, indicating an adequate level of parsimonious fit. Thus, it is evident that the model fulfils all the model fit categories and fits for further analyses.

Standardised regression weights and their significance for each path in the SEM Model 2 are presented in Table 2. All the paths identified in the model indicate significant positive associations by having p values less than 0.05. The effects from each variable are further analysed to identify the total effects, direct effects, and indirect effects and their significance.

The significance of the direct and indirect effects is evaluated, using Bootstrapping procedures. An effect is considered insignificant if a zero value falls in between the upper boundary and lower boundary. It is evident that the users' TR has standardised direct effects of 0.319 on epistemic value, of 0.111 on hedonic value, and of 0.217 on utilitarian value. On the other hand, these three dimensions of PV indicate significant direct effects of 0.11, 0.35, and 0.289, respectively, on AI. AI was the only variable that has indicated the impact of a direct effect of 0.152 on MPEIU.

In addition, the epistemic, hedonic, and utilitarian dimensions of PV have indicated significant indirect

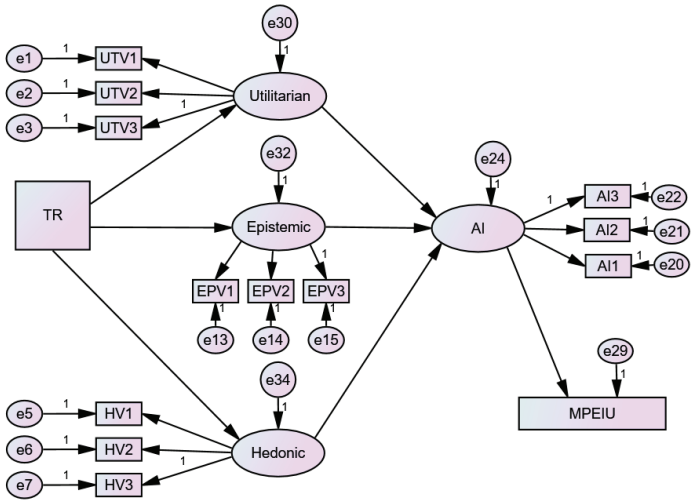

Figure 4: SEM Model 2 – after eliminating all the non-significant paths

Table 3: SEM Model 2 - Standardized regression weights

Path			Estimate	Standard Error	Critical Ratio	P
Epistemic	<---	TR	.319	.111	5.552*	
Utilitarian	<---	TR	.217	.116	4.152*	
Hedonic	<---	TR	.111	.107	2.047	.041
AI	<---	Utilitarian	.289	.062	5.410*	
AI	<---	Hedonic	.350	.074	6.142*	
AI	<---	Epistemic	.110	.073	2.003	.045
UTV3	<---	Utilitarian	.843			
UTV2	<---	Utilitarian	.834	.048	18.331*	
UTV1	<---	Utilitarian	.825	.050	18.185*	
HV3	<---	Hedonic	.721			
HV2	<---	Hedonic	.826	.082	13.873*	
HV1	<---	Hedonic	.796	.081	13.772*	
EPV3	<---	Epistemic	.638			
EPV2	<---	Epistemic	.756	.108	10.934*	
EPV1	<---	Epistemic	.790	.118	10.917*	
AI3	<---	AI	.839			
AI2	<---	AI	.866	.049	18.403*	
AI1	<---	AI	.762	.050	16.588*	
MPEIU	<---	AI	.152	1.059	2.888	.004

* $p \leq 0.001$

effects of 0.017, 0.053, and 0.044, respectively, on MPEIU. Thus, it is evident that the AI mediates the relationships of these dimensions with MPEIU. Moreover, TR had significant indirect effects of 0.137 on AI and of 0.021 on MPEIU through PV's epistemic, hedonic, and utilitarian dimensions. Therefore, it can be concluded that the relationship between TR and AI was mediated by the epistemic, hedonic, and utilitarian dimensions of PV. Thus, in addition to the three dimensions, the relationship between TR and MPEIU is also mediated by AI.

INFERENCES ON RESEARCH HYPOTHESES

H1: Users' technology readiness is equal across all the groups in each demographic factor.

The above hypothesis tests the impact of gender and age of a mobile phone user on users' TR, where the effect on each is tested separately. The statistical evidence of this hypothesis is presented in sections 4.2 and 4.3, respectively. The findings indicate that the gender of mobile phone users does not have a significant effect on the users' TR level. However, the TR level of the respondents significantly varies with the age groups.

H2: There is no direct effect from the users' TR on the adoption intention of mobile phone enabled internet services.

During the structural model evaluation procedure presented under section 4.5, the path indicating the direct effect of the users' TR on their AI was eliminated from the structural model due to the insignificant value of the path coefficients. This implied that the study data does not support the rejection of H2. Therefore, a direct effect cannot be identified from the users' TR on their adoption intention of mobile phone enabled internet services.

In contrast, the existing literature claims a direct association between the users' TR and their adoption intention (Erdoğmuş & Esen, 2011; Meng *et al*., 2010; Parasuraman & Colby, 2014). However, this study finds an effect from the users' TR on their AI mediated by some dimensions of perceived value. Therefore, it can be argued that the contradiction may be due to the fact that none of those studies have considered the mediation effects of other variables on this association.

H3: There is no direct effect from the users' TR on their mobile phone-enabled internet usage.

During the structural model evaluation procedure, the path indicating the direct effect of the users' TR on their MPEIU was eliminated due to the insignificance of the path coefficient. Thus, it is evident that the study data does not support the rejection of H3. Therefore, it can be concluded that a direct effect cannot be identified from the users' TR on mobile phone-enabled internet usage.

This finding also contradicts the existing literature. Although many studies suggest a direct association between the users' TR and their technology usage (Erdoğmuş & Esen, 2011; Meng *et al*., 2010; Parasuraman & Colby, 2014), only a few studies provide empirical evidence. However, this study find an effect from the users' TR on their MPEIU, which is mediated by some dimensions of their perceived value and adoption intention. It can be argued that the contradiction may be because none of those studies consider the mediation effects of other variables on this association.

H4: There is no direct effect from the adoption intention of mobile phone-enabled internet services on mobile phone-enabled internet usage.

The structural model evaluation procedure provides evidence to support the rejection of H1. This finding is in line with the existing literature, and this study provides empirical evidence for the widely accepted association (Davis, 1989; Tan & Chou, 2008; Venkatesh & Davis, 2000; Venkatesh *et al*., 2003).

H5: The effect of the users' TR on their adoption intention of mobile phone-enabled internet services is not mediated by the dimensions of perceived value.

During the structural model evaluation procedure, the uniqueness and economic dimensions of the perceived value were excluded from the model due to the insignificance of the path coefficients. On the other hand, the remaining dimensions: utilitarian, epistemic, and hedonic values indicate the impact of the mediation effects on the effect of the users' TR on their adoption intention of mobile phone-enabled internet services.

The existing literature does not provide any evidence to support or contradict the behaviour of this mediating effect. However, Al-Debei & Al-Lozi (2014) conclude that the utilitarian value and the economic value indicate significant effects on the adoption intention of mobile phone enabled internet services. These findings contradict the findings of this study except that in the case of the utilitarian value. On the other hand, the existing literature predicts a possible effect of users' TR on the dimensions of PV (Parasuraman, 2000; Parasuraman & Colby, 2014), but only a few studies empirically prove the association.

H6: The effect of the users' TR on their mobile phone-enabled internet usage is not mediated by the dimensions of perceived value.

During the structural model evaluation procedure none of the perceived value dimensions indicated any significant effects on mobile phone-enabled internet usage, making it impossible to indicate mediations. Therefore, it can be concluded that the study data does not support the rejection of H6. However, the literature does not provide any contradictory or supportive evidence on this.

CONCLUSION AND PRACTICAL IMPLICATIONS

The following conclusions are arrived at, based on the major findings which indicate practical implications related to the mobile phone-enabled internet usage.

Effect of the users' technology readiness on their mobile phone enabled internet usage

The adoption intention of mobile internet services has a direct positive influence on the mobile phone enabled internet usage. The adoption intention of mobile internet services is indirectly influenced by the users' TR. This implies that the users with a higher level of technology readiness are likely to have a higher adoption intention of mobile internet services and may have a higher usage of them.

Moreover, a user's technology readiness level can be used as an indicator of the possible use of mobile internet services. Therefore, mobile service providers can assess the technology readiness of a potential or an existing user in providing customised mobile data packages. For example, packages with larger data components can be offered to users with a higher level of technology readiness than to those with a lower level of technology readiness.

Effect of the dimensions of perceived value on mobile phone enabled internet usage

Although none of the dimensions of perceived value indicate direct effects on mobile phone enabled internet usage, utilitarian, epistemic, and hedonic values indicate effects on the adoption intention of mobile phone-enabled internet services. These findings imply that the users do not make usage decisions based on the economic or uniqueness value; instead, they make their

usage decisions based on the utilitarian, epistemic, and hedonic values of the mobile internet services.

Thus, mobile service providers can shift their strategic focus to mobile phone-enabled internet service offerings. To gain higher usage rates, service providers can focus on (1) increasing the user perceptions of the effectiveness and efficiency (utilitarian component) of the internet services, (2) improving the pleasure and joy experienced by the users (hedonic component), and (3) enhancing the knowledge delivered through internet services (epistemic component). (4) The effects of service differentiation (uniqueness component) or offering services at a lower price (economic component) may not increase the usage of mobile phone-enabled internet services. It was also found that utilitarian, epistemic, and hedonic value dimensions have indicated mediation effects on the effect of the users' TR on the adoption intention of mobile phone-enabled internet services.

Recommendations for future research

Further research has to be conducted to investigate the impact of the users' technology readiness on the dimensions of the perceived value relating to different technologies such as internet banking, email, online video, *etc*. However, it is observed that the studies that explain this impact are rare in the existing literature.

A research study can focus on the differences in user acceptance of different types of internet services, such as social network apps and news apps offered through a mobile phone. A longitudinal study can also be conducted to investigate the possible changes in the users' technology readiness, value perceptions, and technological behaviour over a period of time.

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