JYX JYVÄSKYLÄN YLIOPISTO UNIVERSITY OF JYVÄSKYLÄ

This is a self-archived version of an original article. This version may differ from the original in pagination and typographic details.

Author(s): Sanakulov, Nodir; Karjaluoto, Heikki

Title: A Cross-Cultural Study of Smartphone Adoption in Uzbekistan and South Korea

Year: 2018

Version: Published version

Copyright: © 2018 IGI Global.

Rights: In Copyright

Rights url: http://rightsstatements.org/page/InC/1.0/?language=en

Please cite the original version:

Sanakulov, N., & Karjaluoto, H. (2018). A Cross-Cultural Study of Smartphone Adoption in Uzbekistan and South Korea. In S. Sarma (Ed.), Global Observations of the Influence of Culture on Consumer Buying Behavior (pp. 171-189). IGI Global. https://doi.org/10.4018/978-1-5225-2727-5.ch011

Global Observations of the Influence of Culture on Consumer Buying Behavior

Sarmistha Sarma
Institute of Innovation in Technology and Management, India

A volume in the Advances in Business Strategy and Competitive Advantage (ABSCA) Book Series

IGI Global
DISSEMINATOR OF KNOWLEDGE

Published in the United States of America by
IGI Global
Business Science Reference (an imprint of IGI Global)
701 E. Chocolate Avenue
Hershey PA, USA 17033
Tel: 717-533-8845
Fax: 717-533-8661
E-mail: cust@igi-global.com
Web site: http://www.igi-global.com

Copyright © 2018 by IGI Global. All rights reserved. No part of this publication may be reproduced, stored or distributed in any form or by any means, electronic or mechanical, including photocopying, without written permission from the publisher. Product or company names used in this set are for identification purposes only. Inclusion of the names of the products or companies does not indicate a claim of ownership by IGI Global of the trademark or registered trademark.

Library of Congress Cataloging-in-Publication Data

Names: Sarma, Sarmistha, editor.
Title: Global observations of the influence of culture on consumer buying behavior / Sarmistha Sarma, editor.
Description: Hershey : Business Science Reference, [2017]
Identifiers: LCCN 2017009376| ISBN 9781522527275 (hardcover) | ISBN 9781522527282 (ebook)
Subjects: LCSH: Consumers' preferences. | Consumer behavior. | Consumer behavior--Cross-cultural studies.
Classification: LCC HF5415.32 .G546 2017 | DDC 658.8/342--dc23 LC record available at https://lccn.loc.gov/2017009376

This book is published in the IGI Global book series Advances in Business Strategy and Competitive Advantage (ABSCA) (ISSN: 2327-3429; eISSN: 2327-3437)

British Cataloguing in Publication Data
A Cataloguing in Publication record for this book is available from the British Library.

All work contributed to this book is new, previously-unpublished material. The views expressed in this book are those of the authors, but not necessarily of the publisher.

For electronic access to this publication, please contact: eresources@igi-global.com.

Chapter 11
A Cross-Cultural Study of Smartphone Adoption in Uzbekistan and South Korea

Nodir Sanakulov
University of Jyväskylä, Finland

Heikki Karjaluoto
University of Jyväskylä, Finland

ABSTRACT

Smartphone technology has changed how mobile phones are perceived and used in daily life. In 2015, global smartphone sales reached 1.4 billion units, representing an increase of 14.4 percent from 2014. Despite this popularity, penetration rates vary significantly across countries, with a global median of 43%. The main purpose of this research is to examine smartphone adoption in Uzbekistan and South Korea based on the Unified Theory of Acceptance and Use of Technology (UTAUT) and to categorize constructs according to the Kano model. The findings indicate significant differences between South Korea and Uzbekistan in terms of technology adoption as a whole and perception of UTAUT constructs.

INTRODUCTION

Smartphone technology has changed how mobile phones are perceived and used in daily life. This technological revolution saw the convergence of mobile phone technology with functions native to consumer products such as digital video and stills cameras, personal digital assistants (PDAs), MP3 players, computers, and GPS tools. This development means that users can now access multiple functions within a single device (Okazaki & Mendez, 2013), and the range of functions is increasing rapidly. In addition to generic phone functions, the smartphone user can access Internet wirelessly, take pictures, perform financial transactions, stream or watch audiovisual content, use various tracking functions, and play high quality video games. With technological advances and an increasingly competitive market that includes newcomers such as Huawei, ZTE, Xiaomi, smartphone prices continue to fall, further increasing their popularity. According to Gartner (2016), 403 million smartphones were sold to end users in the fourth

DOI: 10.4018/978-1-5225-2727-5.ch011

Copyright © 2018, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

quarter of 2015, representing an increase of 9.7% in the same period in 2014. In 2015 as a whole, smartphone sales reached 1.4 billion units—an increase of 14.4% from 2014 (Gartner, 2016)—and the total number of mobile subscriptions reached 7 billion (ITU, 2015). Increasing demand and new possibilities affected market size worldwide, prompting interest from many related industries, including video game developers, who had traditionally focused on PC, Sony PlayStation and Xbox game consoles. Among these, Sony announced an "aggressive" push into mobile gaming following its rival Nintendo's phenomenal success with the mobile game Pokémon Go (Financial Times, 2016). The advertising industry is also rushing to gain market share; according to eMarketer (2016), there will be more than 2 billion smartphone users in the world and 101.37 billion dollars will be spent on mobile advertising, accounting for more than 50% of all digital ad expenditure. Other industries such as banking, retail, travel, and healthcare are also following suit.

Despite this popularity, smartphone penetration rates vary significantly across countries, with a global median of 43% (Pew Research Center, 2016). While one might expect high penetration in Japan as a center for innovative technologies, PewResearch Center (2016) reports actual smartphone usage rate there of around 39% of the total population as compared to 88% in South Korea. Despite general similarities in culture and technology innovativeness, these neighbors differ hugely in terms of smartphone usage. This may involve many intrinsic and extrinsic factors, such as cultural differences (Straub, 1994), usage habits (Shin & Choo, 2012), uncertainty (Edison & Geissler, 2003), and technological availability. Cultural values are a set of guiding principles that affect formation of behaviors and attitudes (Homer & Kahle, 1988), and numerous past studies have reported the influence of culture on technology acceptance and usage (Sanakulov & Karjaluoto, 2017). For example, one comparison of office workers in the US and Japan found that the Japanese tend to prefer more socially present and information-rich channels (Straub, 1994).

Smartphones represent a useful context for this technology acceptance study mainly because the technology remains subject to an ongoing process of acceptance, as confirmed statistically by a number of sources (Gartner, 2016; Pew Research Center, 2016). A literature review conducted by the authors found few cross-cultural studies comparing smartphone adoption. To contribute to the understanding of the role of cultural factors and their effects, the present study investigates smartphone adoption in two different groups: Uzbeks and South Koreans. The results obtained from each group are compared and categorized in terms of each group's perceptions of the particular determinants of adoption.

As a theoretical base, the study employs a slightly modified version of Venkatesh and Morris's (2003) Unified Theory of Acceptance and Use of Technology (UTAUT). Over the past decade, UTAUT has been used increasingly in academic research for its relatively high explanatory power and convenience in use. After measuring the strengths of UTAUT drivers and identifying differences among the two groups, the study categorizes each driver according to Kano's theory to examine group differences in perception based on each construct's level of importance.

Uzbekistan and South Korea were chosen for several reasons. First, both countries represent Asian culture in general but differ significantly from each other in cultural, geographic, and economic terms; while South Korea is a developed country, Uzbekistan can be characterized as developing. Second, smartphone usage rates vary greatly across these countries (BuddeComm, 2017; Pew Research Center, 2016), and in all cases, smartphone adoption is still growing. Finally, the resources to conduct this research in these countries were available to the authors. As compared to South Korea, Uzbekistan remains unexplored in this context, and the comparison using extended UTAUT represents an opportunity to explore differences in adoption and perceptions, as well as testing the generalizability of UTAUT.

The paper is organized in five sections. The next section outlines the study's theoretical background. The third section describes the research model and hypothesis development, and the fourth section describes the method. Finally, the fifth and sixth sections present results and conclusions.

BACKGROUND

Technology Acceptance

Over the past few decades, information and communications technology's rapid development has impacted the everyday lives of consumers and professionals alike, helping to increase efficiency, productivity, convenience, and ever-new possibilities. Today, it is hard to imagine a household or office without such technologies, which are regularly updated. Firms invest heavily in implementing new technologies in the workplace and in training employees to use them. However, despite generally positive perceptions, the implementation of new technologies may not go smoothly or as planned (Speier & Venkatesh, 2002), as for instance in the case of sales force automation implementations in firms (Bush, Moore, & Rocco, 2005; Morgan & Inks, 2001).

All of the above factors have triggered huge interest in technology acceptance, which has been the subject of widespread and high-quality research. This trend has continued as new products are developed, new ideas are born, bringing changes in consumer lifestyles and perceptions of technology. Existing frameworks and theories include the technology acceptance model (TAM), the theory of reasoned action (TRA), the theory of planned behavior (TPB), and the unified theory of acceptance and use of technology (UTAUT). Although the newest of these was developed more than a decade ago, these approaches remain in ongoing use, extended and adapted for various contexts and settings (Sanakulov & Karjaluoto, 2017). The literature review conducted for this study showed that most studies of smartphone adoption were based on either TAM (Chun, Lee, & Kim, 2012; Jeon & Park, 2015; Wan Ismail, Kit, Chan, Buhari, & Muzaini, 2012) or UTAUT (Jung, Hur, & Kim, 2015; Sanakulov & Karjaluoto, 2017).

Unified Theory of Acceptance and Use of Technology

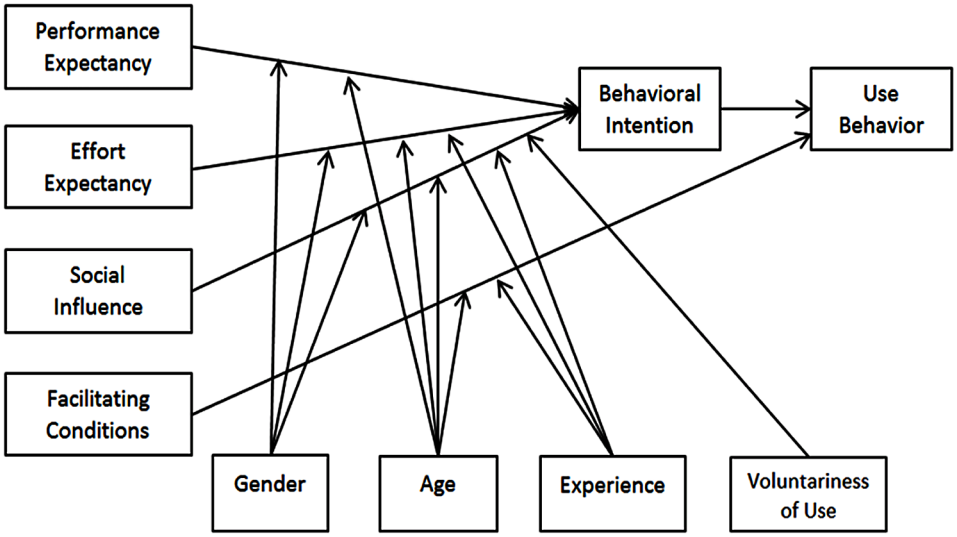
As noted above, a high level of research interest has yielded many theories and models, enhancing understanding of technology acceptance in various contexts and settings. Researchers have drawn on the theory most suited to the specific context or extended available theories to adapt them as required. All these theories and models share many similarities, such as equivalent constructs, although with different names. Venkatesh et al. (2003) proposed the Unified Theory of Acceptance and Use of Technology (UTAUT) following their detailed analysis and integration of a number of eight existing theories and their principles for determining technology acceptance. These were TAM, TRA, TPB, information diffusion theory (IDT), social cognitive theory (SCT), the model of PC utilization (MPCU), the motivational model (MM), and the combined TAM and TPB (C-TAM-TPB).

UTAUT comprises four main constructs: performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC), based on 32 variables from analyzed models. UTAUT also integrates four moderating factors: gender, age, experience, and voluntariness of use (Figure 1). The model increased predictive power for technology acceptance to 70%, which is major improvement on TAM (Venkatesh et al., 2003). Looking closely at UTAUT's main determinants, one can see that,

like TAM, it emphasizes utilitarian value as a determinant of technology acceptance. Like the TAM construct of perceived usefulness (PU), PE is defined as the degree to which an individual believes that using the system will help him or her to attain gains in job performance. This is considered to be the strongest predictor of intention to use technology (Venkatesh et al., 2003). EE is defined as degree of ease associated with the use of the system. Three constructs from other models capture this idea: perceived ease of use (TAM/TAM2), complexity (MPCU), and ease of use (IDT) (Venkatesh et al., 2003). SI is the extent to which significant others are thought to believe that one should use the new system. This idea is represented as a subjective norm in TRA, TAM2, TPB, as a social factor in MPCU, and as an image in IDT (Venkatesh et al., 2003). It implies that one's behavior is influenced by how one expects to be viewed by others as a result of using the technology. FC is the extent to which an individual believes that organizational and technical infrastructure exists to support use of the system and relates to constructs in three other models: perceived behavioral control in TBP, facilitating conditions in MPCU, and compatibility in IDT. These constructs have been confirmed by many past studies as determinants of behavioral intention (de Sena Abrahão, Moriguchi, & Andrade, 2016; Im, Hong, & Kang, 2011; McKeown, McKeown, Anderson, & Anderson, 2016; Yuvaraj & Yuvaraj, 2016).

Since its emergence, a growing number of researchers have used UTAUT in a range of contexts (Williams, Rana, & Dwivedi, 2015); for example, Martins et al. (2014) examined Internet banking adoption; Oliveira et al. (2016) and de Sena Abrahão et al. (2016) investigated mobile payments; Šumak et al. (2016) examined differences between pre- and post-adopters of interactive whiteboards; and Yuvaraj (2016) looked at adoption of social media in the recruitment of library professionals and faculty members. According to Google Scholar (January 2017), Venkatesh et al.'s original 2003 article on UTAUT has been cited more than 15,000 times.

Figure 1. UTAUT model
Source: Venkatesh et al., 2003.



Cultural Factors and Technology Acceptance

The role of cultural factors in technology acceptance has attracted widespread interest for many years, and ongoing market globalization means that this remains an important topic. When corporate multinationalism began to emerge, an increasing number of corporations sought to establish a presence in new markets by relocating factories and opening subsidiaries. In these circumstances, it was important for managers to know as much as possible in advance about the likely impact of culture on technology acceptance (Straub, 1994). While practitioners sought to understand cultural differences in order to tackle the ensuing challenges, researchers explored such differences in the interests of theory building—for instance, to enhance theory's generalizability to different cultural settings (Venkatesh & Zhang, 2010). There is by now a significant body of theoretical work that contributes to understanding at various cultural levels —national, organizational and group (Ho, Raman, & Watson, 1989; Straub, 1994)—and the impacts of culture on technology acceptance are well documented (Choi & Totten, 2012; Dai & Palvi, 2009; Jung et al., 2015; Olasina & Mutula, 2015; Veiga, Floyd, & Dechant, 2001).

Among many definitions of culture, the mostly widely used (Srite & Karahanna, 2006) is Hofstede's (1980). He defined culture as collective programming of the mind, which distinguishes one group from another. This system of collective values plays an important role in guiding a person's life and directly influences the formation of human behaviors and attitudes (Hofstede, 1980; Homer & Kahle, 1988; Roth, 1995). Hofstede proposed a conception of culture based on four dimensions: power distance, individualism-collectivism, masculinity-femininity, and uncertainty avoidance; he later added the dimension of long-term vs. short-term orientation (Appendix, Table 7). Hofstede's model has subsequently been employed in many cross-cultural studies, which have confirmed the varying influence of these cultural values on technology adoption, depending on the particular culture (Leidner & Kayworth, 2006; McCoy, Galletta, & King, 2007; Tarhini, Hone, & Liu, 2015). As one example, Straub et al. (1994) reported that uncertainty avoidance had the most direct bearing on Japanese consumers' preferences in their use of communication media.

While South Korea can be characterized as a highly industrialized developed country, Uzbekistan is a less industrialized developing country. A multilingual and multicultural nation with collectivist values, Uzbekistan was under Soviet rule for many decades, which influenced the development of cultural values and traditions. Although no prior research has examined Uzbekistan's cultural dimensions, Gygi and Spyridakis (2007) have characterized Uzbekistan as medium to high on masculinity and uncertainty avoidance, and high on collectivism, power distance, and long-term orientation. Table 1 summarizes the national characteristics of both countries.

Table 1. Comparison of cultural dimensions: Uzbekistan and South Korea

Dimensions	Uzbekistan	South Korea
Power distance	high	high
Collectivism	high	high
Masculinity	medium to high	high
Uncertainty avoidance	medium to high	high
Long-term orientation	high	high

Source: Adapted from Hofstede, (2016) Gygi & Spyridakis (2007).

Kano Model

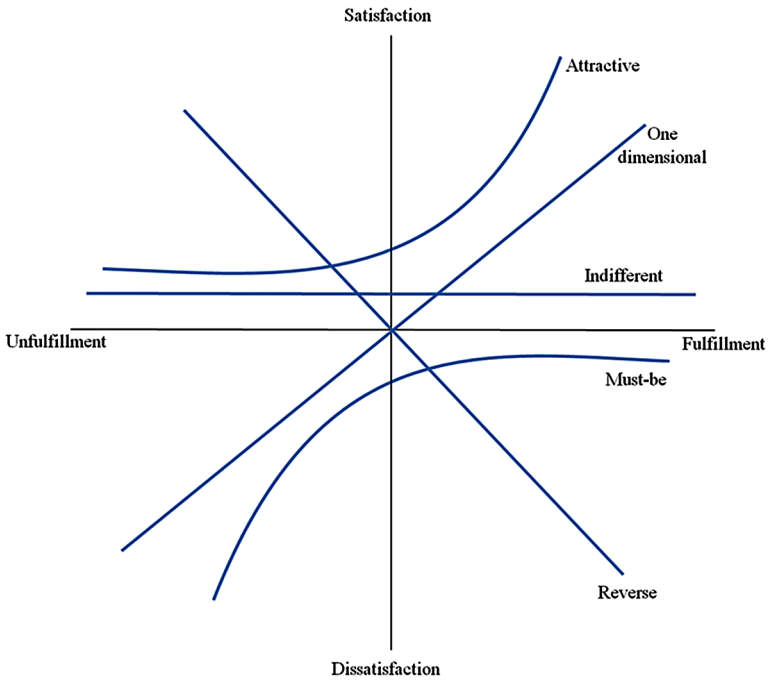
The Kano model (theory of attractive quality) was formulated by Noriaki Kano and his colleagues to categorize product or service attributes related to customer satisfaction (Kano, Seraku, Takahashi, & Tsuji, 1984). The model was inspired by Herzberg et al.'s motivation-hygiene theory (Kano et al., 1984), which articulates how factors causing job satisfaction differ from those causing job dissatisfaction (Herzberg, Mausner, & Snyderman, 1959). Similarly, Kano argued that not all product or service attributes have a linear relationship with customer satisfaction. He proposed that customer satisfaction is more complex, advanced, and multidimensional than simply satisfying performance requirements (Gregory & Parsa, 2013), demanding the more advanced approach shown in Figure 2. Kano proposed that product attributes can be divided into the following five categories.

Must-be attributes do not necessarily increase customer satisfaction when fulfilled, but their absence causes increased dissatisfaction. These attributes are considered basic requirements—for example, customers assume that a TV comes with a remote control as a basic attribute.

Attractive attributes are sources of delight and surprise that result in customer satisfaction. As these attributes are not expected by customers, their absence does not alter satisfaction negatively or positively. A good example is the availability of power sockets on intercity buses or free Wi-Fi in metro stations.

One-dimensional attributes are positively related to customer satisfaction; they increase satisfaction when provided, and their absence or poor performance causes dissatisfaction. The customer is well aware of these attributes, and firms compete on this basis—for example, greater car mileage or longer smartphone battery life translates into higher levels of customer satisfaction.

Figure 2. Kano model



Indifferent attributes have no impact on customer satisfaction or dissatisfaction whether present or absent. These qualities are of no significance, and in most cases, customers do not even notice them.

Reverse attributes are the opposite of must-be attributes; their presence triggers dissatisfaction, and their absence increases satisfaction.

The Kano model is dynamic in the sense that consumer perceptions of certain attributes change over time (Kano, 2001). An attribute considered "attractive" eventually becomes "must-be" as a generic quality or when a technology becomes easily accessible. A good example is the touchscreen mobile phone; when first introduced, the touchscreen function was an "attractive" attribute that positively influenced customer satisfaction. As this technology became more affordable, it lost some of its appeal and eventually became "must-be." Mobile phone makers are now competing by improving touch sensor sensitivity, screen size and resolution, and picture and video quality. Another example is the TV remote control, which has completed this cycle; now, it is hard to imagine a TV without a remote control because it is expected that every TV set will have one.

To categorize each attribute, Kano developed a questionnaire comprising pairs of questions for each attribute. These pairs are unique in asking for the respondent's reaction when a certain attribute is present (functional) and when it is absent (dysfunctional). As shown in Figure 3, respondents choose from five categorical responses for both functional and dysfunctional questions.

Responses related to attributes are sorted into five quality categories (Kano et al., 1984); each pair of questions is evaluated jointly, using the Kano evaluation table in Table 2.

This method is very simple and helps to establish how attributes are perceived by customers. Based on the findings of such a survey, manufacturers or service providers can focus on those areas they wish to improve, allocating resources as required. This growing field of research draws on original ideas presented by Kano and his team (Witell, Löfgren, & Dahlgaard, 2013) in various contexts such as the ski industry (Matzler & Hinterhuber, 1998), as well as retail (Zielke, 2008), hospitality and tourism (Gregory & Parsa, 2013), packaging (Löfgren & Witell, 2005), nursing homes (Yeh & Chen, 2014), and logistics customer service (Florez-Lopez & Ramon-Jeronimo, 2012).

Figure 3. Functional and dysfunctional questions in Kano questionnaire
Source: Matzler & Hinterhuber, 1998.

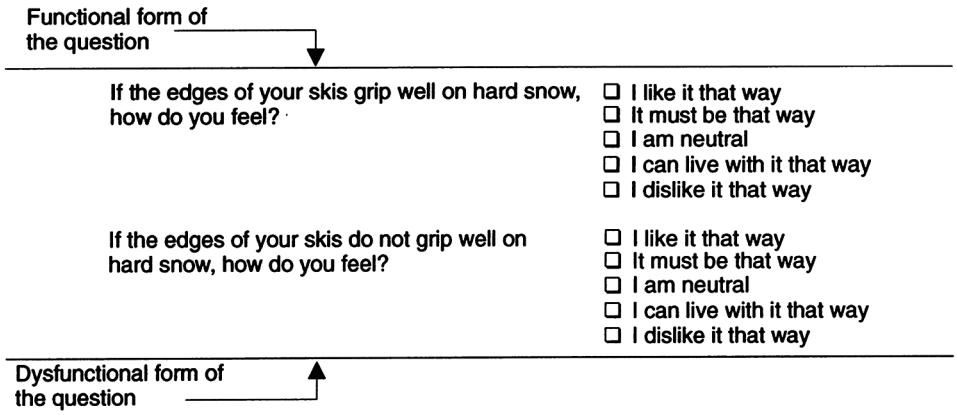


Table 2. Kano evaluation table

Product Requirement		Dysfunctional Question				
		I Like It That Way	It Must Be That Way	I Am Neutral	I Can Live with It That Way	I Dislike It That Way
Functional question	I like it that way	Q	A	A	A	O
	It must be that way	R	I	I	I	M
	I am neutral	R	I	I	I	M
	I can live with it that way	R	I	I	I	M
	I dislike it that way	R	R	R	R	Q

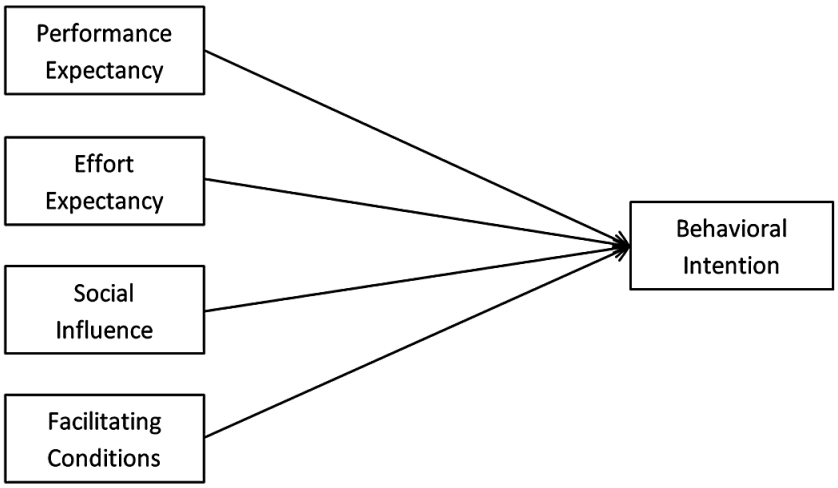
HYPOTHESIS DEVELOPMENT

Based on the literature review and comparison of the available acceptance models, UTAUT was selected as the base model for this study. The results of the literature review show that UTAUT is to date less widely used than TAM. Only a few UTAUT-based studies have examined smartphone adoption, and even fewer were cross-cultural. On introducing UTAUT, Venkatesh et al. (2003) called for further extension and testing of the model in new contexts. By way of response, this study employed the UTAUT model to compare smartphone adoption in two countries as shown in Figure 4.

Performance Expectancy

Aligning with Venkatesh et al. (2003), many past studies have reported that PE is a strong positive determinant of user intention to adopt or use a technology (de Sena Abrahão et al., 2016; Oliveira et al., 2016; Sanakulov & Karjaluoto, 2015; Yuvaraj & Yuvaraj, 2016). The present study proposes that smartphone

Figure 4. Research model



use increases job performance by virtue of the various computer-like functions that smartphones offer. The following hypothesis is therefore proposed.

H1: Performance expectancy has a positive influence on behavioral intention to use smartphones.

Effort Expectancy

EE is the perceive ease of use associated with a system; a system that is perceived as easy to use is more likely to be accepted (Davis, 1989). As smartphones are more difficult to use than conventional mobile phones, EE seems likely to positively affect behavioral intention. On that basis, the following hypothesis is proposed.

H2: Effort expectancy has a positive influence on behavioral intention to use smartphones.

Social Influence

SI is the degree to which significant others are thought to believe that one should use a new system; in other words, behavioral intention is affected by surrounding social factors such as the opinions of others (Venkatesh et al., 2003). This influence is stronger when the user is not familiar with the technology or when their opinion of the technology is not well formed. According to Sanakulov and Karjaluoto (2015), 87% of studies in their review showed SI to be a significant determinant of behavioral intention. As smartphones are regarded as an enabling factor for social interaction, it seems likely that there will be a significant path relationship between SI and BI. On that basis, the following hypothesis is proposed.

H3: Social influence has a positive influence on behavioral intention to use smartphones.

Facilitating Conditions

Facilitating conditions refer to consumers' perceptions of the resources and support available to perform a behavior (Venkatesh, Thong, & Xu, 2012). This idea is captured in three different constructs: perceived behavioral control (TPB/DTPB, C-TAM-TPB), facilitating conditions (MPCU), and compatibility (IDT) (Venkatesh et al., 2003). Unlike UTAUT, where FC is hypothesized to influence technology use directly, Venkatesh et al. (2012) suggested that, in a consumer context, FC influences both intention and use behavior because availability to consumers may depend on such factors as technology, service provider, and device. Based on this argument, the following hypothesis is proposed.

H4: Facilitating conditions have a positive influence on behavioral intention to use smartphones.

METHODOLOGY

Research Design

A questionnaire was developed encompassing demographics, UTAUT, and Kano components of the study. The literature review also identified questions used in past studies, and those of relevance to the smartphone context were included. The first part asked about smartphone ownership and the respondent's country, age, and gender. In the second part, items measuring UTAUT constructs were adopted from Venkatesh et al. (2003). The third part was a Kano questionnaire, with slight modifications of the original. All scale-based questions used a 7-point Likert scale.

In the Kano section, questions were asked as per the original instructions. Before asking the pair of questions, a brief description of the attribute was provided, enabling the respondent to evaluate it using the examples provided. To ensure that the respondent was not confused by the questions' similarity, the dysfunctional "NOT" was typed in capital letters. Paired questions (one functional and one dysfunctional) for each attributed were asked in the following order:

- **Functional Question:** What if a smartphone offers performance and productivity?
- **Dysfunctional Question:** What if a smartphone does NOT offer performance and productivity?

An initial questionnaire was compiled and peer-reviewed to detect possible mistakes, to improve quality, and to ensure that questions were logically ordered. Particular care was taken to make questions clear and understandable regardless of the respondent's educational level. The questionnaire was subsequently translated into the respective languages by native speakers fluent in English.

Data Collection

The survey was administrated online using Google survey tools. A link to the online survey was posted in popular social media groups and forums and shared with colleagues and friends, who were also asked to share the link with others for convenience sampling. The survey remained active for two weeks.

RESULTS

Data Description and Reliability Testing

For the purposes of this study, participants were targeted from the general population of Uzbekistan and South Korea. Responses containing random and incomplete answers were excluded from further analysis, and the final data consisted of 318 usable responses, of which 94% were smartphone users. Respondents aged 31–39 years accounted for 26% of the sample; 8% were aged 40–50+ years; the largest group (66% of respondents) included those aged 30 and below. As the research model consisted of multi-item constructs, it was important to check the reliability of items in each construct. The test most commonly used in similar studies was Cronbach's α; according to Nunnally (1978), a Cronbach's α greater than 0.6 is acceptable while 0.7 is highly reliable. To improve reliability, items that lowered Cronbach's α were removed from further analysis. The results are set out in Table 3.

Table 3. Construct reliability test

Constructs	Cronbach's α
Performance expectancy	0.86
Effort expectancy	0.81
Social influence	0.94
Facilitating conditions	0.78
Behavioral intention	0.95

Model Validation and Hypothesis Testing

A linear regression analysis (which estimates the coefficients of a linear equation involving one or more independent variables to predict the value of the dependent variable) was conducted to test the proposed hypotheses and research model. The research model was tested by assessing the significance of the path coefficients for relationships between the independent variables (PE, EE, SI, and FC) and the dependent variable (BI), where R^2 is the amount of variation in the dependent variable. To do this, the UTAUT model was first tested with the entire dataset. The results supported the model (R^2 of BI = 0.21); the significance of the research model was $F = 14.726$ ($p \leq 0.001$). Results for the total sample supported three out of the four hypotheses; while performance expectancy ($\beta = 0.169$, $p \leq 0.01$), social influence ($\beta = 0.197$, $p \leq 0.001$), and facilitating conditions ($\beta = 0.171$, $p \leq 0.01$) influenced behavioral intention significantly, the effect of effort expectancy on behavioral intention was not significant (β = 0.082, ns). For comparison purposes, these tests were then conducted separately for both countries. The results showed the positive effect of performance expectancy and facilitating conditions on behavioral intention in both countries. However, the positive effect of effort expectancy on behavioral intention ($\beta = 0.230$, $p \leq 0.05$) was observed only in the Korea group, and the path between social influence and behavioral intention was significant ($\beta = 0.205$, $p \leq 0.01$) only in the Uzbek group. Once paths of research model were tested for each group, multi-group comparison based on Chi-square difference test was conducted to check significance of cultural effects on paths tested. The test results showed that it was only significant Hypothesis 3. Table 4 summarizes the combined test results.

Table 4. Estimation of the proposed model

Path	Total Sample		Uzbekistan		South Korea		χ2 Threshold
	β	*t*-Value	*β*	*t*-Value	*β*	*t*-Value	
PE→BI	.169**	2.979	.208**	2.734	.252**	2.899	ns
EE→BI	.082	1.305	.032	.392	.230*	2.368	ns
SI→BI	.197***	3.504	.205**	2.667	-.127	-1.336	2.282*
FC→BI	.171**	2.765	.166*	2.111	.272*	2.592	ns

***$p \leq 0.001$, **$p \leq 0.01$, *$p \leq 0.05$.

Kano Results

The first step in analyzing the Kano questionnaire results was to tabulate the survey responses. The second step was to allocate attributes to categories based on response frequencies. For example, for PE, the number of answer combinations categorized as "indifferent" was higher than for other categories in the total population, indicating that, for the total population, PE was perceived as an indifferent attribute. Interestingly, tested attributes were categorized as "indifferent" for the total sample and among South Koreans. For Uzbeks only, EE was categorized as "must be," and FC as "one-dimensional." The results of the Kano questionnaire are set out in Table 5.

SOLUTIONS AND RECOMMENDATIONS

The analysis yielded some interesting findings in relation to all three study objectives. The UTAUT model proved to be significant at the $p \leq 0.001$ level, and only the relationship between effort expectancy and behavioural intention was not supported in the total sample. There is reason to believe that this is a normal occurrence, as according to Sanakulov and Karjalouto (2015) and Williams et al. (2015), this relationship is least often significant among UTAUT paths. Additionally, unlike most past studies, the influence of facilitating conditions on behavioural intention was tested here. Among UTAUT relations, it was least tested in past studies (Williams et al., 2015); here, it proved to be significant in all categories, aligning with Venkatesh et al.'s (2012) suggestion that in a consumer context, facilitating conditions influence both intention and use behavior. When analyzed separately, the Uzbekistan sample produced the same outcome as the total sample. In the Korea sample, the relation between social influence and behavioral intention was negatively insignificant. This can be explained by possible differences in usage rate and perceptions in these countries. While no official statistics are available for the number of smartphone users in Uzbekistan, research and consultancy company BuddeComm (2017) reported that, in early 2016, the number of mobile phone subscribers was 24 million, and mobile broadband subscribers exceeded 16 million (in a total population of 31 million) (UNDP, 2017). These figures are lower than those in South Korea, which is a world leader in smartphone ownership (Pew Research Center, 2016). It seems likely that, as smartphone adoption in Uzbekistan is still developing, users take account of social influence when making decisions. In contrast, South Koreans do not perceive social factors as important because smartphone usage has become the norm.

The analysis categorized UTAUT constructs according to the Kano model in each group, and the results were surprisingly similar in almost all cases (Table 6). This unexpected result prompted repeated data checking and re-evaluation, but the results were unchanged. In the Uzbek sample only, there was

Table 5. Results for Kano classification of attributes

Constructs	Total Sample		Uzbekistan		South Korea	
Performance expectancy	Indifferent	45%	Indifferent	28%	Indifferent	66%
Effort expectancy	Indifferent	40%	Must-be	33%	Indifferent	64%
Social influence	Indifferent	64%	Indifferent	52%	Indifferent	80%
Facilitating conditions	Indifferent	44%	One-dimensional	35%	Indifferent	64%

a significantly different result; effort expectancy was categorized as "must-be" and facilitating conditions as "one-dimensional". Again, this can be explained by current usage rate and perceptions; because smartphone adoption is ongoing in Uzbekistan, the effort associated with using smartphones is perceived as significant. In other words, they have not yet become "experts" in using smartphones, and effortless usage appeals to them. Uzbeks consider facilitating conditions to be one-dimensional, which means that better facilitating conditions improve satisfaction while absence or poor performance cause dissatisfaction. This outcome is unsurprising in Uzbekistan because the technical infrastructure needed for smartphone use is currently at a developmental stage. For example, fast wireless broadband connections (3G and 4G) cover only some parts of the country, local mobile services such as ticketing and banking are not widely used, and Wi-Fi hotspots are not widely available.

FUTURE RESEARCH DIRECTIONS

While the present study achieved its objectives, it has limitations that may impact the findings. First, an online survey is not ideal as a means of collecting data in Uzbekistan because of the low Internet penetration rate; according to the World Bank's (2017) estimates, 43% of Uzbeks were Internet users in 2015. As a majority of respondents were males aged 30 years or younger, the results cannot be generalized to the wider population; this segment of the population are active Internet users who benefit from the connectivity provided at educational institutions and workplaces. This limitation can be overcome by conducting a postal survey and by applying strict national population quotas. Second, the Kano questionnaire yielded the same results for the Korea group as for the total sample. In the Kano evaluation, the "indifferent" category frequency of (36%) is high (Ek & Çıkış, 2015), suggesting that those confused by this unusual questionnaire might resort to non-polarized (neutral) answers that are classified as indifferent. The survey was conducted online, and the Kano questionnaire was one part of the whole questionnaire. As these factors may have affected responses, face-to-face interviews might help to ensure survey quality. Finally, there was no measurement of cultural dimensions in Uzbekistan or Central Asian countries, and the study relied on the characterization by Gygi and Spyridakis (2007). Uzbekistan is multicultural and the most populous country in Central Asia with 31 million inhabitants, accounting for approximately 42% of the region's population (UNDP, 2017). As an important market attracting great interest from foreign investors since the Soviet Union collapsed, a cultural perspective can help managers to understand and prepare for possible challenges and opportunities when operating there.

CONCLUSION

In recent decades, a multitude of technology acceptance studies in a wide range of settings and contexts have helped to advance this field of research. However, the present literature review revealed that although these studies are increasing in number, few have been cross-cultural. The contribution of the present study is threefold. First, based on UTAUT, the study examined technology adoption in Uzbekistan and South Korea. Second, the comparison showed that individual UTAUT constructs have varying effects on technology acceptance in the two countries. Finally, the main constructs used here were classified according to the Kano model to determine how each construct is perceived by each group. Most of the findings align with those of previous studies.

The UTAUT framework proved an appropriate model for testing smartphone adoption, and the results will be of interest to both groups in light of current adoption rates. The authors hope that the study will enhance this area of research in cross-cultural settings, as well as contributing to knowledge of how these groups perceive the drivers that determine technology adoption.

REFERENCES

BuddeComm. (2017). *BuddeComm facts and figures*. Retrieved from https://www.budde.com.au/Research/Uzbekistan-Telecoms-Mobile-Broadband-Statistics-and-Analyses?r=51

Bush, A. J., Moore, J. B., & Rocco, R. (2005). Understanding sales force automation outcomes: A managerial perspective. *Industrial Marketing Management*, *34*(4), 369–377. doi:10.1016/j.indmarman.2004.09.016

Choi, Y. K., & Totten, J. W. (2012). Self-construals role in mobile TV acceptance: Extension of TAM across cultures. *Journal of Business Research*, *65*(11), 1525–1533. doi:10.1016/j.jbusres.2011.02.036

Chun, H., Lee, H., & Kim, D. (2012). The integrated model of smartphone adoption: Hedonic and utilitarian value perceptions of smartphones among korean college students. *Cyberpsychology, Behavior, and Social Networking*, *15*(9), 473–479. doi:10.1089/cyber.2012.0140 PMID:22817671

Dai, H., & Palvi, P. C. (2009). Mobile commerce adoption in china and the united states: A cross-cultural study. *ACM SIGMIS Database*, *40*(4), 43–61. doi:10.1145/1644953.1644958

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *Management Information Systems Quarterly*, *13*(3), 319–340. doi:10.2307/249008

De Mooij, M., & Hofstede, G. (2002). Convergence and divergence in consumer behavior: Implications for international retailing. *Journal of Retailing*, *78*(1), 61–69. doi:10.1016/S0022-4359(01)00067-7

de Sena Abrahão, R., Moriguchi, S. N., & Andrade, D. F. (2016). Intention of adoption of mobile payment: An analysis in the light of the unified theory of acceptance and use of technology (UTAUT). *RAI Revista De Administração E Inovação, 13*(3), 221-230.

Edison, S. W., & Geissler, G. L. (2003). Measuring attitudes towards general technology: Antecedents, hypotheses and scale development. *Journal of Targeting Measurement and Analysis for Marketing*, *12*(2), 137–156. doi:10.1057/palgrave.jt.5740104

Ek, F. İ., & Çıkış, Ş. (2015). Integrating the kano model into architectural design: Quality measurement in mass-housing units. *Total Quality Management & Business Excellence*, *26*(3-4), 400–414. doi:10.1080/14783363.2013.835898

eMarketer. (2016). *Mobile ad spend to top $100 billion worldwide in 2016, 51% of digital market*. Retrieved from http://www.emarketer.com/Article/Mobile-Ad-Spend-Top-100-Billion-Worldwide-2016-51-of-Digital-Market/1012299

Financial Times. (2016). *Sony makes move on mobile gaming*. Retrieved from http://www.ft.com/cms/s/0/71cb30cc-728e-11e6-bf48-b372cdb1043a.html#axzz4KsUX64Dk

Florez-Lopez, R., & Ramon-Jeronimo, J. M. (2012). Managing logistics customer service under uncertainty: An integrative fuzzy kano framework. *Information Sciences*, *202*, 41–57. doi:10.1016/j.ins.2012.03.004

Gartner. (2016). *Gartner says worldwide smartphone sales grew 9.7 percent in fourth quarter of 2015.* Retrieved from http://www.gartner.com/newsroom/id/3215217

Geert Hofstede. (2016). *Cultural dimension scores*. Retrieved from http://geert-hofstede.com/countries.html

Gregory, A. M., & Parsa, H. (2013). Kanos model: An integrative review of theory and applications to the field of hospitality and tourism. *Journal of Hospitality Marketing & Management*, *22*(1), 25–46. do i:10.1080/19368623.2011.641073

Gygi, K., & Spyridakis, J. (2007). Developing a cultural model to support web site localization: A case study of uzbek school web sites. *Annual Conference-Society for Technical Communication*, *54*, 1.

Herzberg, F., Mausner, B. S., & Snyderman, B. (1959). The motivation to work. New York.

Ho, T. H., Raman, K., & Watson, R. T. (1989). Group decision support systems: The cultural factor. *ICIS,* 119-129.

Hofstede, G. (1980). Motivation, leadership, and organization: Do american theories apply abroad? *Organizational Dynamics*, *9*(1), 42–63. doi:10.1016/0090-2616(80)90013-3

Homer, P. M., & Kahle, L. R. (1988). A structural equation test of the value-attitude-behaviour hierarchy. *Journal of Personality and Social Psychology*, *54*(4), 638–646. doi:10.1037/0022-3514.54.4.638

Im, I., Hong, S., & Kang, M. S. (2011). An international comparison of technology adoption: Testing the UTAUT model. *Information & Management*, *48*(1), 1–8. doi:10.1016/j.im.2010.09.001

ITU. (2015). *ICT facts and figures*. Retrieved from http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2015.pdf

Jeon, E., & Park, H. (2015). Factors affecting acceptance of smartphone application for management of obesity. *Healthcare Informatics Research*, *21*(2), 74–82. doi:10.4258/hir.2015.21.2.74 PMID:25995959

Jung, C. M., Hur, W., & Kim, Y. (2015). A comparison study of smartphone acceptance between korea and the USA. *International Journal of Mobile Communications*, *13*(4), 433–453. doi:10.1504/IJMC.2015.070064

Kano, N. (2001). Life cycle and creation of attractive quality. *4th QMOD Conference*, Linköping, Sweden.

Kano, N., Seraku, N., Takahashi, F., & Tsuji, S. (1984). Attractive quality and must-be quality. *Journal of the Japanese Society for Quality Control*, *14*(2), 147–156.

Leidner, D. E., & Kayworth, T. (2006). Review: A review of culture in information systems research: Toward a theory of information technology culture conflict. *Management Information Systems Quarterly*, *30*(2), 357–399.

Löfgren, M., & Witell, L. (2005). Kano's theory of attractive quality and packaging. *The Quality Management Journal*, *12*(3), 7.

Martins, C., Oliveira, T., & Popovič, A. (2014). Understanding the internet banking adoption: A unified theory of acceptance and use of technology and perceived risk application. *International Journal of Information Management*, *34*(1), 1–13. doi:10.1016/j.ijinfomgt.2013.06.002

Matzler, K., & Hinterhuber, H. H. (1998). How to make product development projects more successful by integrating kanos model of customer satisfaction into quality function deployment. *Technovation*, *18*(1), 25–38. doi:10.1016/S0166-4972(97)00072-2

McCoy, S., Galletta, D. F., & King, W. R. (2007). Applying TAM across cultures: The need for caution. *European Journal of Information Systems*, *16*(1), 81–90. doi:10.1057/palgrave.ejis.3000659

McKeown, T., McKeown, T., Anderson, M., & Anderson, M. (2016). UTAUT: Capturing differences in undergraduate versus postgraduate learning? *Education + Training*, *58*(9), 945–965. doi:10.1108/ET-07-2015-0058

Morgan, A. J., & Inks, S. A. (2001). Technology and the sales force: Increasing acceptance of sales force automation. *Industrial Marketing Management*, *30*(5), 463–472. doi:10.1016/S0019-8501(99)00115-7

Okazaki, S., & Mendez, F. (2013). Exploring convenience in mobile commerce: Moderating effects of gender. *Computers in Human Behavior*, *29*(3), 1234–1242. doi:10.1016/j.chb.2012.10.019

Olasina, G., & Mutula, S. (2015). The influence of national culture on the performance expectancy of e-parliament adoption. *Behaviour & Information Technology*, *34*(5), 492–505. doi:10.1080/0144929X.2014.1003326

Oliveira, T., Thomas, M., Baptista, G., & Campos, F. (2016). Mobile payment: Understanding the determinants of customer adoption and intention to recommend the technology. *Computers in Human Behavior*, *61*, 404–414. doi:10.1016/j.chb.2016.03.030

Pew Research Center. (2016). *Smartphone ownership rates skyrocket in many emerging economies, but digital divide remains.* Retrieved from http://www.pewglobal.org/2016/02/22/smartphone-ownership-rates-skyrocket-in-many-emerging-economies-but-digital-divide-remains/

Roth, M. S. (1995). Effects of global market conditions on brand image customization and brand performance. *Journal of Advertising*, *24*(4), 55–75. doi:10.1080/00913367.1995.10673489

Sanakulov, N., & Karjaluoto, H. (2015). Consumer adoption of mobile technologies: A literature review. *International Journal of Mobile Communications*, *13*(3), 244–275. doi:10.1504/IJMC.2015.069120

Sanakulov, N., & Karjaluoto, H. (2017). A cultural comparison study of smartphone adoption in uzbekistan, south korea and turkey. *International Journal of Mobile Communications*, *15*(1), 85–103. doi:10.1504/IJMC.2017.080579

Shin, D., & Choo, H. (2012). Exploring cross-cultural value structures with smartphones. *Journal of Global Information Management*, *20*(2), 67–93. doi:10.4018/jgim.2012040104

Speier, C., & Venkatesh, V. (2002). The hidden minefields in the adoption of sales force automation technologies. *Journal of Marketing*, *66*(3), 98–111. doi:10.1509/jmkg.66.3.98.18510

Srite, M., & Karahanna, E. (2006). The role of espoused national cultural values in technology acceptance. *Management Information Systems Quarterly*, 679–704.

Straub, D. W. (1994). The effect of culture on IT diffusion: E-mail and FAX in japan and the US. *Information Systems Research*, *5*(1), 23–47. doi:10.1287/isre.5.1.23

Šumak, B., & Šorgo, A. (2016). The acceptance and use of interactive whiteboards among teachers: Differences in UTAUT determinants between pre-and post-adopters. *Computers in Human Behavior*, *64*, 602–620. doi:10.1016/j.chb.2016.07.037

Tarhini, A., Hone, K., & Liu, X. (2015). A cross-cultural examination of the impact of social, organisational and individual factors on educational technology acceptance between british and lebanese university students. *British Journal of Educational Technology*, *46*(4), 739–755. doi:10.1111/bjet.12169

The World Bank. (2017). *Internet users.* Retrieved from http://data.worldbank.org/indicator/IT.NET.USER.P2?locations=UZ

UNDP. (2017). *About Uzbekistan.* Retrieved from http://www.uz.undp.org/content/uzbekistan/en/home/countryinfo.html

Veiga, J. F., Floyd, S., & Dechant, K. (2001). Towards modelling the effects of national culture on IT implementation and acceptance. *Journal of Information Technology, 16*(3), 145-158. doi:10.1080/02683960110063654

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *Management Information Systems Quarterly*, 425–478.

Venkatesh, V., Thong, J., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *Management Information Systems Quarterly*, *36*(1), 157–178.

Venkatesh, V., & Zhang, X. (2010). Unified theory of acceptance and use of technology: US vs. china. *Journal of Global Information Technology Management*, *13*(1), 5–27. doi:10.1080/1097198X.2010.10856507

Wan Ismail, W. K., Kit, H., Chan, P., Buhari, N., & Muzaini, A. (2012). Acceptance of smartphone in enhancing patient-caregivers relationship. *Journal of Technology Management & Innovation*, *7*(3), 71–79. doi:10.4067/S0718-27242012000300007

Williams, M. D., Rana, N. P., & Dwivedi, Y. K. (2015). The unified theory of acceptance and use of technology (UTAUT): A literature review. *Journal of Enterprise Information Management*, *28*(3), 443–488. doi:10.1108/JEIM-09-2014-0088

Witell, L., Löfgren, M., & Dahlgaard, J. J. (2013). Theory of attractive quality and the kano methodology–the past, the present, and the future. *Total Quality Management & Business Excellence*, *24*(11-12), 1241–1252. doi:10.1080/14783363.2013.791117

Yeh, T., & Chen, S. (2014). Integrating refined kano model, quality function deployment, and grey relational analysis to improve service quality of nursing homes. *Human Factors and Ergonomics in Manufacturing & Service Industries*, *24*(2), 172–191. doi:10.1002/hfm.20358

Yuvaraj, M., & Yuvaraj, M. (2016). Adoption of technology in recruitment of library professionals and faculty members: Case study of social media in India. *The Bottom Line*, *29*(4), 241–250. doi:10.1108/BL-03-2016-0016

Zielke, S. (2008). Exploring asymmetric effects in the formation of retail price satisfaction. *Journal of Retailing and Consumer Services*, *15*(5), 335–347. doi:10.1016/j.jretconser.2007.08.005

KEY TERMS AND DEFINITIONS

Cronbach's Alpha: A statistical tool for assessing reliability, internal consistency of a set of scale items.

Hofstede's Cultural Dimensions: A set of dimensions for distinguishing one culture from another.

Kano Model: A theory of customer satisfaction that classifies product or service attributes into five categories.

Likert Scale: A tool commonly used in questionnaire based research to measure attitudes and opinions of respondents.

Literature Review: A scholarly paper that presents current knowledge including theoretical and methodological contributions and discusses academic publications on a particular subject.

Smartphone: A mobile phone that runs on operating system and has many functions of a computer such as accessing internet, running various applications and sensors.

Technology Acceptance Model (TAM): A theory for predicting acceptability of a technology based on perceived usability and perceived ease of use of the technology.

Technology Adoption: A process that begins with awareness of technology´s existence, mentally accepting it and utilizing it.

Unified Theory of Acceptance and Use of Technology (UTAUT): A theory for explaining user intention to use a technology and usage behaviour.

APPENDIX

Table 6. Definitions of UTAUT constructs

Construct	Definition
Performance expectancy	Degree to which an individual believes that using the system will help him or her to attain gains in job performance.
Effort expectancy	Degree of ease associated with the use of the system.
Social influence	Degree to which an individual perceives that important others believe he or she should use the new system.
Facilitating conditions	Degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system.

Source: Venkatesh et al., 2003.

Table 7. Hofstede's national culture dimensions

Dimension	Definition
Power distance	Power distance is the extent to which less powerful members of a society accept that power is distributed unequally.
Individualism vs. collectivism	In individualist cultures, people look after themselves and their immediate family only. In collectivist cultures, people belong to groups that look after them in exchange for loyalty.
Masculinity vs. femininity	In masculine cultures, the dominant values are achievement and success. The dominant values in feminine cultures are caring for others and quality of life.
Uncertainty avoidance	Uncertainty avoidance is the extent to which people feel threatened by uncertainty and ambiguity and try to avoid these. In cultures of strong uncertainty avoidance, there is a need for rules and formality to structure life, and competence is a strong value, resulting in belief in experts.
Long-term vs. short-term orientation	Long-term orientation is the extent to which a society exhibits a pragmatic, future-oriented perspective rather than a conventional historic or short-term perspective.

Source: Adapted from De Mooij & Hofstede, (2002).