The Effects of Innovation Factors on Smartphone Adoption among Nurses in Community Hospitals

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Abstract

A relatively new mobile technological device is the smartphone—a phone with advanced features such as Windows Mobile software, access to the Internet, and other computer processing capabilities. This article investigates the decision to adopt a smartphone among healthcare professionals, specifically nurses. The study examines constructs that affect an individual's decision to adopt a smartphone by employing innovation attributes leading to perceived attitudes. We hypothesize that individual intentions to use a smartphone are mostly determined by attitudes toward using a smartphone, which in turn are affected by innovation characteristics. Innovation characteristics are factors that help explain whether a user will adopt a new technology. The study consisted of a survey disseminated to 200 practicing nurses selected from two community hospitals in the southeastern United States. In our model, the innovation characteristics of observability, compatibility, job relevance, internal environment, and external environment were significant predictors of attitude toward using a smartphone.

Key words: smartphone adoption, innovation factors, health information technology, nurses, information systems, health policy

Introduction

Concerns about the escalating costs and the quality of healthcare delivered in the United States continue to mount.[1] Health information technology (HIT) has emerged as one of the possible solutions for lowering healthcare costs and reducing medical error rates.[2, 3] Industries have accepted information technology (IT) for assisting functional activities, and currently IT has been strategically utilized in various markets. Information technology in healthcare would provide clinicians with information and tools, such as clinical decision support, that presumably would improve the quality of care and reduce potential medical errors. Many other industries have previously embraced information technology and mobile devices, such as personal digital assistants (PDAs), equipped with integrated wireless connections. Recently, investments in healthcare IT have significantly risen, and according to several recent studies they are anticipated to continue to increase.[4–7]

A relatively new mobile technological device is the smartphone, a mobile phone with advanced features beyond those of PDAs. The smartphone emerged in 2000, and sales have consistently increased with each succeeding year. Smartphones are not yet ubiquitous in the healthcare sector, though many experts predict that this technology will soon become an essential component of hospital operations.[8] Vendors expect a higher demand for the device and are increasingly dispensing smartphones to healthcare professionals in hospitals.[9] Numerous recent studies have demonstrated an increased use of PDAs and other mobile devices in healthcare settings.[10–13]

A driving force for the popularity of smartphones is their wireless connectivity and portability features. These features, along with the standard telecommunication capabilities provided by smartphones, allow individuals access to e-mail and the Internet. Smartphones would presumably allow healthcare professionals such as nurses to input clinical data into patient records. Although smartphones would not be universally applicable for all nurses, they may prove particularly useful for the collection of some pertinent data, such as vital signs and fluid data. Thus, the smartphone may prove to be quite useful in the nursing workflow, but acceptance will depend on how well the user interface supports particular nursing workflows. Although the user interface of a smartphone does not promote expediency and efficiency, conceivably a smartphone could in certain instances provide functions such as word processing and presentation software for continuing professional research and collaboration among nurses.[14]

A nurse's job is highly information intensive. According to Lange, nurses not only are involved with the use of healthcare information systems but also are the creators of clinical information in healthcare organizations.[15] Nurses' jobs routinely include extensive documentation. Bowles found that nurses may spend 50 percent of their day maintaining documentation of patient records.[16] Although new devices such as tablet personal computers or computers on wheels are becoming more popular, a survey conducted in 2004 by the Spyglass Consulting Group finds that many nurses prefer PDAs.[17] Despite new technologies, many nurses still perform the task of information documentation at nursing stations, where nursing information systems are traditionally located. Smartphones that have even greater capabilities than PDAs may prove particularly beneficial to nurses for tasks such as documenting vital signs, viewing lab values, retrieving procedures that may not be commonly performed, or viewing medications and their pertinent side effects.[18] Thus, smartphones can be used to track patients and remain abreast of important elements involved in care coordination.

In examining the adoption and acceptance of technological innovations, many previous academic studies have applied the Technology Acceptance Model (TAM) and Diffusion of Innovations (DOI) theory as underlying models. Researchers have studied user adoption of mobile technology based on these two theories.[19, 20] However, few studies have empirically investigated factors affecting adoption of smartphones based on individual and organizational perceptions specifically among healthcare professionals such as nurses. Thus, the study of smartphone adoption based on users' perceptions of the technology could significantly contribute to the body of HIT knowledge.

This article investigates the decision to adopt a smartphone among healthcare professionals, specifically nurses. The study examines the constructs that affect an individual's decision to adopt a smartphone by employing innovation attributes leading to perceived attitude. We investigate specific smartphone adoption drivers, such as cognitive and innovation factors. We hypothesize that individual intentions to use a smartphone are mostly determined by attitudes toward using a smartphone, which in turn are affected by innovation characteristics. It should also be noted that the smartphone and its user interface must satisfy the requirements of the

nursing function that the smartphone is intended to support. This is important because not all devices can support all functions, and a key to adoption is whether the particular device and its user interface meet the end user's requirements for efficiency, screen size for readability, and easy access to other related functions that may be needed. In this study, we develop and test a research model for explaining individual intentions and attitudes toward using a smartphone. This knowledge should further assist with the understanding of the influential factors that affect a smartphone user's behavior.

Literature Review and Research Hypotheses

Numerous studies have found that IT adoption is largely dependent on managerial support within organizations.[21] Organizational support further enables users to engage in effective IT usage by providing hardware and end-user support.[22] Previous studies have also shown that social interactions affect the acceptance of mobile wireless technologies.[23–25]

The TAM probably is the most popular theory explaining user acceptance and behavior related to new technologies. Davis (1989) developed the TAM and investigated the determinants of user acceptance that may explain a user's behavior in regard to the user's general attitude toward the use of computing technologies.[26] According to the TAM, users evaluate the system based on the perceived ease of use and perceived usefulness of the system. If the system is perceived as easy to use and useful, a user would have a positive attitude toward the system, which in turn leads to the user's intention to use the system. Then, the intention results in the user's actual decision to use the system.

Many recent IT adoption and diffusion studies have relied heavily on the TAM and modified TAMs. The TAM has been replicated in various IT adoption studies, and strong empirical findings have supported the model's use in survey instruments.[27] Thus, as a consequence of this empirical validity, we incorporated aspects of the TAM into this investigation.

Chau and Hu evaluated physicians' acceptance of telemedicine technology and suggested that the TAM may be more appropriate than other theories examining technology acceptance by individual professionals.[28] A previous study conducted by Park and Chen indicated that behavioral intention to use a smartphone was largely influenced by perceived usefulness and attitude toward using a smartphone.[29] They further postulated that perceived usefulness and perceived ease of use positively determine attitudes toward using a smartphone.[30]

DOI theory proposes an array of innovation characteristics that may impact a user's perception of the innovation preceding the adoption. As a result, these factors would affect the speed of adoption. These attributes provide a theoretically based set of behavioral beliefs for our study. Rogers defined innovation as a new use of an idea, a practice, or an object by the unit of adoption.[31] The smartphone was introduced in 2000. Thus, we view smartphone devices as recent innovations and employ Rogers's DOI theory in our study. Researchers have used the theory to better understand whether an individual or an organization will adopt new innovations.[32]

Kwon and Zmud (1987) suggested that information technology might be studied more effectively by adjusting research factors related to DOI theory with application research.[33] Figure 1 displays factors derived from Kwon and Zmud's model and adjusted after preliminary evaluations were conducted with sample participants. The innovation factors of personal demographics, personal experience, and job relevance were incorporated into our model. An innovation factor from the Kwon and Zmud model known as trialability was removed from our model to reduce possible confusion with another innovation factor known as observability. Thus,

the factors in our model include attitude toward using smartphone, compatibility, observability, job relevance, personal demographics, personal experience, internal environment, and external environment. The TAM and modified TAMs examine the relationship between attitude and behavioral intention and suggest that attitude may affect actual intention to use new technologies.

The research factors are operationalized as individual questions in the survey questionnaire. Compatibility has a positive effect on the rate of adoption. When a user recognizes that an innovation is compatible with a system, the more the innovation will be adopted.[34] Observability has a positive effect on adoption. When a user has an opportunity to observe an innovation, the innovation is more likely to be adopted. Job relevance has a positive effect on adoption. Personal demographics consist of the participant's age, gender, and personal traits. Personal experience includes factors such as a participant's computer background, education, and literacy. Previous literature shows a positive relationship between personal demographics and personal experience with innovation adoption.[35] Organizational factors consist of the internal and external environments. More specifically, the internal environment includes support from senior management, the size of the organization, the quality of operation, and the user's involvement. The external environmental includes competitor pressure, the availability of external support, and current trends of smartphone use.[36]

The seven circles (CM, OB, JR, PD, PE, INV, EXV) at the bottom of Figure 1 display the innovation factors discussed above. From the above discussion about innovation diffusion theory, the following relationships are hypothesized:

1. A user's attitude toward using a smartphone is affected by the user's compatibility with a smartphone.
2. A user's attitude toward using a smartphone is affected by the observability of a smartphone.
3. A user's attitude toward using a smartphone is affected by the relevance of a smartphone to the user's job.
4. A user's attitude toward using a smartphone is affected by the user's personal demographics.
5. A user's attitude toward using a smartphone is affected by the user's personal experience.
6. A user's attitude toward using a smartphone is affected by the user's internal environment.
7. A user's attitude toward using a smartphone is affected by the user's external environment.

The middle circle (AT) and the top circle (BI) of Figure 1 describe two TAM factors: attitude and behavioral intention to use, respectively. We hypothesized that a user's attitude toward using a smartphone would have a positive effect on the user's behavioral intention to use a smartphone.

Methods

The study sample consisted of healthcare professionals, specifically nurses, conveniently selected from two community hospitals in the southeastern United States. One hospital is a nonprofit, and the other is a for-profit hospital. Each hospital provides a variety of healthcare services: multispecialty medical care, regional community clinics, nursing home care, behavioral health services, vision centers, pharmacies, and air and ground ambulances. The hospitals serve a

city and collectively have more than 500 employed healthcare professionals. The specific technology examined was a smartphone.

The study instrument was a survey divided into three sections (see Appendix). The first section defined the smartphone and also included a hypothetical situation that described a nurse's typical day and suggested how the use of a smartphone may assist in his or her work. This was followed by instructions to assist with completion of the survey. The second section contained the constructs used to measure the independent variables that presumably affect the adoption of a smartphone. Multiple questions were used to measure each independent variable. A five-point Likert scale ranging from "strongly disagree" to "strongly agree" was used to measure the responses. The third section contained five questions that collected sociodemographic data about the respondents.

The survey was disseminated to a total of 200 practicing nurses by one of three methods. We conducted site visits to the facilities and attended hospital meetings, thereby directly distributing the survey to the healthcare professionals. We created an Internet link through our university that was provided to each hospital's information technology department. The hospital information technology department then distributed an e-mail with this link to the nurses. We also asked each hospital's chief nursing officer to inform the hospital's nurses of the survey, which was available either through the Internet link or by e-mail. Respondent confidentiality was maintained, and no identifying information was recorded. The survey was reviewed and approved by the institutional review boards at the researchers' university and at both hospitals.

Results

Using the three survey dissemination methods, we collected 80 responses (6 of which were not utilized due to incomplete answers) from a total of approximately 200 nurses. This translates into a response rate of 40 percent. This rate reflects the typically low response rates commonly seen in IT studies and among healthcare professionals. Respondents included 7 males (9.5 percent) and 67 females (90.5 percent). The respondents' occupational titles included registered nurse (RN), licensed practical nurse (LPN), and nurse manager. On approximate average, the participants had 10.5 years of work experience in their current organizations and 16 years of total work experience in healthcare. The averages were calculated as the sum of means in each range multiplied times the percentage represented. The mean value for the category "26 years and above" is 33 assuming the top end of the range is 40 years, which is an approximate estimate. Table 1 provides additional details of the sample's demographics.

In reliability measurement (Table 2), each predictor had a value for Cronbach's alpha of greater than 0.70. All factors except attitude exceeded 0.70, and the attitude factor also exceeded 0.70 when item AT2 ("Using the smartphone while working is UNPLEASANT") was removed. These results indicate both the internal consistency and the precision of the measurement instrument. Thus, this instrument provides a valid representation of the sample, and the constructs satisfy both adequacy and reliability.

After producing Pearson correlation coefficients between factors, we inspected the data to assess the pattern of relationships. Utilizing principal component analysis, we tested each item with SPSS orthogonal rotation (i.e., varimax). We evaluated seeking variables with correlation coefficients that were high enough but not too high. Factors were extracted with eigenvalues higher than 1. Factors loading less than 0.4 are not displayed. The remaining factors are listed in Table 3. Factors that exceeded a minimum acceptable limit of 0.5 were retained in the final analysis.

The regression model summarized in Table 4 demonstrates attitude toward using a smartphone regressed on observability, compatibility, job relevance, personal demographics, personal experience, internal environment, and external environment. The overall *F* value for the model is 12.96, which was significant at the .01 level. For affective commitment, 64 percent of the observed variance is accounted for by the linear combination of the independent variables. The regression model was used to assess the hypotheses. Because no relationship was found between attitude toward using a smartphone and behavioral intention to use (denoted as BI) from the data, BI was not included in the final model.

As shown in Table 4, attitude toward using a smartphone was affected by several independent variables: observability ($\beta = .31$, $t = 2.47$), compatibility ($\beta = .79$, $t = 11.22$), job relevance ($\beta = .56$, $t = 5.72$), internal environment ($\beta = .51$, $t = 5.06$), and external environment ($\beta = .23$, $t = 1.99$). The smaller the value of significance (p-value) and the larger the t-value, the greater the contribution of that predictor. In this model, observability ($t = 2.47$, $p = .01$), compatibility ($t = 11.22$, $p = .001$), job relevance ($t = 5.72$, $p = .00$), internal environment ($t = 5.06$, $p = .00$), and external environment ($t = 1.99$, $p = .05$) were all significant predictors of attitude toward using a smartphone. From the magnitude of the t-values, we can see that compatibility, job relevance, and internal environment had a higher impact than observability and external environment. Beta values were calculated because they provide insight into the importance of a predictor in the model. The beta value for compatibility (.79) indicates that compatibility had the strongest relationship to the attitude toward using a smartphone, while job relevance showed the next strongest relationship ($\beta = .56$).

Discussion

The study provided empirical support for five of the hypotheses. The innovation characteristics of observability, compatibility, job relevance, internal environment, and external environment were found to influence a user's attitude toward using a smartphone.

The innovation characteristic of observability was found to be statistically significant in our study. This innovation characteristic suggests that prior observation of a smartphone or a brief trial of using a smartphone presumably is a very important step in adopting a smartphone. This may be because observing other healthcare professionals using a smartphone positively impacts a user's attitude regarding the relevance of a smartphone. Furthermore, a short trial using a smartphone may positively affect a user's attitude toward the universal functions and applicability of a smartphone in a clinical setting. This appears to be particularly true when smartphone technology is new to the user.

This investigation also showed that compatibility was an important predictor of a user's intention to utilize a smartphone. When nurses viewed smartphones as having broad compatibility with other technologies in the hospital, they had a positive attitude toward using a smartphone. Another significant innovation characteristic was job relevance. If a nurse believed a smartphone assisted with improving patient care, he or she would more readily adopt a smartphone.

A previous study showed a positive relationship of personal demographics and personal experience to innovation adoption.[37] Yet in our study, the innovation characteristics of personal demographics and personal experience were not found to be significant. One possible explanation for this finding may be the extensive clinical experience of the nurses and nurse managers in our study. The average occupational experience was 13.4 years. It may be presumed

that nurses with extensive experience may be more reluctant to embrace new technologies. In fact, the survey data indicated a low adoption rate of smartphones by nurses.

Another innovation characteristic, internal environment, was a significant predictor of smartphone adoption. This innovation characteristic has also been shown to be significant in previous studies.[38] The internal environment includes organizational characteristics such as the size of the organization, the support from executive management, and the ease and efficiency of operational management. According to Lu, organizational changes related to information technology adoption provide a necessary infrastructure for mobile devices.[39] Our results, coupled with previous data, appear to demonstrate the importance of management support in the decision of hospital employees such as nurses to adopt emerging technologies. This is principally because management support of an emerging technology such as a smartphone appears to promote a pervasive positive attitude among hospital employees. When a smartphone assists a nurse in a workplace setting, it may come to be recognized as an indispensable tool needed to complete everyday daily assignments and certain clinical routines. This perception presumably would increase the use of the smartphone by other healthcare professionals in the hospital in the future. Thus, the internal environment can influence a healthcare professional's desire to adopt new information and/or new technologies.

Our research, similar to other empirical studies, was not without limitations. The results of this study are tempered and limited by our small sample size and the low response rate. Second, our study was conducted in one geographical area within the context of healthcare organizations. It is possible that intention to use a smartphone may differ in other geographical regions due to a number of reasons. Thus, additional research on a broader geographical scale with a larger sample size is warranted.

Conclusion

The findings of this study have important implications for healthcare managers, policymakers, and health service researchers. This study reveals a valuable adaptation of the innovation constructs specifically with respect to the acceptance of a mobile technology such as a smartphone by nurses. Smartphones are capable of changing how healthcare is delivered principally because they merge and integrate multiple and varied technological functions into a single device that is both versatile and portable. Although smartphones have many advantages, their functionality is not without limits. Smartphones have limited available screen size, and users often express discontent in terms of readability. Nevertheless, our study provided empirical support that the innovation characteristics of observability, compatibility, job relevance, internal environment, and external environment influence nurses' attitudes toward use of a smartphone.

Information technology was originally perceived as merely a supporting tool in hospitals and other healthcare organizations; however, it has become an important element in the provision and delivery of healthcare services. Health information technology is also an important component in shaping current health policy objectives by providing healthcare providers such as nurses with tools and information to help decrease healthcare costs, reduce medical errors, and improve the quality and coordination of care. Healthcare professionals' attitudes toward and acceptance of technology need to be more fully understood to further facilitate the creation of HIT products such as smartphones that will be readily embraced and used by healthcare professionals to improve the delivery and quality of healthcare.

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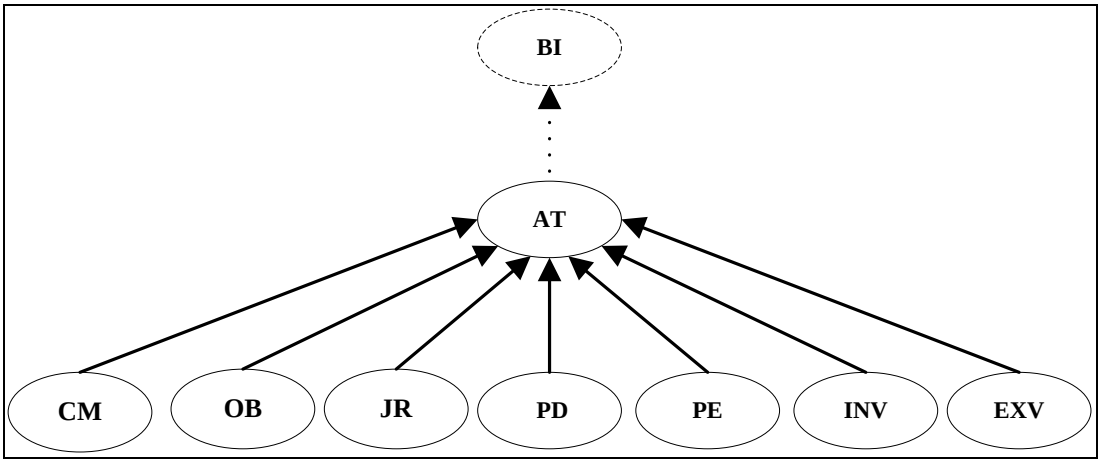
Figure 1

Research Model



BI: Behavioral intention to use smartphone
AT: Attitude toward using smartphone
CM: Compatibility
OB: Observability
JR: Job relevance
PD: Personal demographics
PE: Personal experience
INV: Internal environment
EXV: External environment

Table 1

Sample Demographics

Sociodemographic characteristics	Frequency	Percentage
Sex		
Male	7	9.5
Female	67	90.5
Total	74	100.0
Current job experience		
Less than 1 year	4	7.4
1–5 years	14	25.9
6–10 years	15	27.8
11–15 years	7	13.0
16–20 years	4	7.4
21–25 years	5	9.3
26 years and beyond	5	9.3
Total job experience		
Less than 1 year	2	3.7
1–5 years	12	22.2
6–10 years	15	27.8
11–15 years	5	9.3
16–20 years	6	11.1
21–25 years	7	13.0
26 years and beyond	7	13.0

Table 2

Reliability of Constructs

Construct	Variable items	Cronbach's alpha
Behavioral intention	4	.924
Attitude	4	.768 (AT2 deleted)
Compatibility	3	.873
Observability	2	.810
Job relevance	3	.956
Personal demographics	3	.824
Personal experience	2	.946
Internal environment	4	.933
External environment	3	.707

Table 3

Factor Analysis of Constructs

Construct	Loading
BI1	.82
BI2	.83
BI3	.87
BI4	.77
AT1	.41
AT3	.82
AT4	.82
CM1	.81
CM2	.84
CM3	.76
OB1	.84
OB2	.84
JR1	.94
JR2	.96
JR3	.90
PD1	.80
PD2	.67
PD3	.80
PE1	.95
PE2	.95
INV1	.89
INV2	.72
INV3	.88
INV4	.88
EXV1	.79
EXV2	.72
EXV3	.43

Table 4

Summary of Regression Model

Independent variable	B	SE B	beta	*t*-value (*p*-value)
Observability	0.22	0.09	.31	2.47 (.01)
Compatibility	0.78	0.06	.79	11.22 (.00)
Job relevance	0.39	0.07	.56	5.72 (.00)
Personal demographics	0.10	0.09	.13	1.10 (.27)
Personal experience	0.70	0.13	.06	0.54 (.56)
Internal environment	0.62	0.12	.51	5.06 (.00)
External environment	0.25	0.12	.23	1.99 (.05)

Notes:
Dependent variable: Attitude toward using a smartphone; overall $F = 12.96$; $p = .01$; $R^2 = .64$; adjusted $R^2 = .59$
B: Unstandardized Coefficient; SE: Standard Error

Appendix

Situational Description for Nurses

Please read the situational description contained below regarding the functions of a smartphone and then answer the accompanying survey questions. A smartphone functions to facilitate the integration of a computer, personal digital assistant, digital camera, and cell phone into one mobile device. The following hypothetical situation serves simply as an example of the possible functions and use of a smartphone for nurses.

Suppose the hospital provides each healthcare professional with a smartphone. Thus, upon arriving at the hospital in the morning, you can use the smartphone to check your schedule and pertinent data (vital signs, progress notes, etc.) of the registered patients. In addition to the daily census of patients, you discover a message posted regarding an educational forum which involves a speech from a leading expert regarding a novel approach to treating a disease. After completing morning rounds, you receive a message from another nurse. She explains that a newly admitted patient is uncomfortable, so you respond by consulting with the vitals displayed on your smartphone.

When you have a moment in the afternoon, you use the smartphone to scan the relevant literature which you previously downloaded to help remain abreast of recent advances in nursing. You have a brief meeting later that afternoon to present your patients' pertinent clinical data and vital signs to the next shift of nurses. After the meeting, you can scan your schedule for the next day before leaving the hospital. You also review the information regarding a new medicine with the possible side-effects on your smartphone.

Thus, the smartphone not only integrates the functions of day-to-day planning, cell phone and messages from the hospital, but also integrates Web browsing, camerawork, and so on which are helpful to improving the efficiency and quality of your job.

The following survey questions are designed to assess how much you would accept this product. Thank you for your participation.

Survey

I could complete a job using the smartphone…

Behavioral Intention

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Assuming that I have the smartphone, I intend to use it.					
2. Whenever possible, I intend to use the smartphone in my job.					
3. To the extent possible, I would use the smartphone to do different things.					
4. I intend to increase my use of the smartphone in the future.					

Attitude

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
5. Using the smartphone for working is (would be) a good idea.					
6. Using the smartphone while working is UNPLEASANT.					
7. Using the smartphone is beneficial to my work.					
8. I like (would like) using the smartphone for working.					

Observability

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
9. It is easy for me to observe others using the smartphone in my work.					
10. I have had a lot of opportunity to see the smartphone being used.					

Compatibility

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
11. Using the smartphone is compatible with aspects of my work.					
12. Using the smartphone fits into my work style.					
13. I think that using the smartphone fits well with the way I like to work.					

Job Relevance

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
14. In my job, usage of the smartphone is high.					
15. In my job, usage of the smartphone is relevant.					
16. The best practice of completing tasks in the day-to-day activities is likely to be influenced by adopting the smartphone.					

Personal Demographic

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
17. Using the smartphone is dependent on the age of the individual.					
18. Using the smartphone is dependent on the gender of the individual.					
19. Using information systems (IS) innovation is dependent on the personal traits of the individual.					

Personal Experience

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
20. Using the smartphone is dependent on one's education of relevant IS area.					
21. Using the smartphone is dependent on one's experience with relevant IS applications.					

Internal Environment

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
22. The greater the support from top management, the more likely the smartphone will be adopted.					
23. The size of the organization will affect the smartphone adoption.					
24. Using the smartphone affects the quality of the organizational operation.					
25. Using the smartphone will require user involvement in the development process.					

External Environment

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
26. The pressure from competitors is likely to influence the decision to use the smartphone.					
27. The availability of external support for implementing the smartphone is important to the success of using the innovation.					
28. The trends of smartphone usage will influence my decision to use.					

Finally, would you please provide the following information? All the answers will be kept confidential. Thank you very much.

29. Smartphone model being used:

30. Gender: □Male □Female

31. Job Title:

32. Current job experience:

□ less than 1 year □ 1–5 years □ 6–10 years

□ 11–15 years □ 16–20 years □ 21–25 years □ 26 years and above

33. Total working experience:

□ less than 1 year □ 1–5 years □ 6–10 years

□ 11–15 years □ 16–20 years □ 21–25 years □ 26 years and above