A Studying on Factors Affecting Decision to Use Smart Tourism Applications using extended TAM

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Abstract: - The paper presented the theoretical extended accept new technology model (TAM), based on this theory and the results of previous studies, the research has built a model to study the factors impact the decision to use the smart travel applications in Vietnam. The study identified the following factors: Perceived ease of use, Perceived usefulness, Social impact, Self-control, Information security concerns and Service quality affecting the decision to use smart travel applications. The Hypothesis is tested through EFA discovery factor analysis, regression methods performed on SPSS software. From the results, the study proposes solutions to promote smart applications in Vietnam.

Key-Words: - Extended TAM model; EFA discovery factor; Smart tourism.

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1 Introduction
A smart city is the application of information and communication technology connecting sensors, high-speed wireless networks, large data processing to improve the quality of life in urban areas, improving the quality of service of the city. City government, reducing energy consumption, effective management of natural resources. In general, the assessment of a smart city based on the level of intelligence of the infrastructure that affects transport, health, construction, energy, management, etc. Smart streets, need to build intelligent systems: intelligent transportation system, smart tourism system, smart education system, ... In which the smart tourism system is well-placed. In many countries, the smart travel system is represented by smart travel applications. Can understand smart tourism is a tourism model built based on information and communication technology; help interaction, the close connection between managers, businesses and tourists, to improve the quality of customer service, while making the management more convenient.

In Vietnam, there have been many cities and provinces applying smart tourism applications: Hanoi, Da Nang, Ninh Binh, Ho Chi Minh City. Besides, there are also several cities and provinces in the plan to apply smart tourism applications such as Tuyen Quang, Ba Ria - Vung Tau.

According to a survey of Q & M e Market Research Company published in June 2017, 88% of tourists search for information online, of which, 35% regularly use the internet to search for travel information. There are a variety of potential smart tourism users in Vietnam. Therefore, the question is that the internet there are quite a lot of information pages on tourism and there may appear unorthodox websites, so the application of smart travel applications has become indispensable in the era of industrial network 4.0.
Accurate assessment of the factors affecting smart travel application decisions will be helpful for all three application providers (Hanoi Department of Tourism, Vietnam Posts and Telecommunications Group), Travel business businesses and app users. Accurately measure the factors that influence the decision to use smart travel applications, help application providers develop their applications in the best way, meeting the needs of people. Thereby attracting more users to choose and use the smart travel application. On the user side, users have more access to the utilities that technology brings to tourism.

Among the provinces and cities that are applying smart tourism applications, Hanoi is the capital of Vietnam with many famous tourist destinations. Specifically, Hanoi has had popular travel applications: Ha Noi City Guide, My Ha Hoi, Trip Hunter, Hanoi Department of Tourism website, … The research topic is aimed at students. Therefore, the research team decided to choose the topic: “Application of TAM (Technology acceptance model) to study the factors affecting the decision to use smart tourism applications in the context of Hanoi direction. to build a smart city”.

2 The Theory of Acceptance of Technology

The Technology Acceptance Model (TAM) developed by Davis (1989). The TAM adopts the TRA model because of the relationships to explain an individual’s acceptable behaviour. TAM has considered as the powerful and meticulous way to represent the antecedent of system usage through beliefs about two construct: 1) The Perceived Usefulness (PU) and 2) The Perceived Ease of Use (PEOU) combined of an information system (Davis, 1989, 1993; Davis et al., 1989, 1992). PU is defined as “the degree to which a person believes that using a particular system would enhance his or her job performance”. PEOU is defined as “the degree to which a person believes that using a particular system would be free of effort”.

The attitude toward using is depended by two other factors such as Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). Perceived Usefulness is influenced by Perceived Ease of Use. On the other hand, both Perceived Usefulness and Perceived Ease of Use are influenced by external variables (EV). Behavioural intention to use is determined by the attitude towards using the new system. Finally, behavioural intention to use affect to actual use (Davis et al., 1989).

![Figure 1. Technology Acceptance Model](source: Davis et al. (1989))

Many previous types of research have applied TAM that proves the role of this theory. Thus, in the research of Yang et al. (2007), the authors conducted a survey questionnaire to collect citizen’s perceived levels of their intention of E-tax. The constructs and questionnaire develop through that collected about technology acceptance model and diffusion of innovation of articles in the last few years. The objects of the survey were the citizen who has experienced tax. The results of this study showed the suitable to apply TAM in E-tax. Thus, the attitude and Perceived Usefulness have a direct influence on the construct behaviour intention, these results suitable with the context of E-tax research from other research such as Hung et al. (2006); Wu et al. (2005); and Chang et al, (2005). Moreover, the construct Perceived Usefulness and Perceived Ease of Use have a significantly positive effect on the attitude toward using E-tax. This result proved consistent with the empirical research by Chang (2005) and Hung (2006). The study confirmed most of the TAM’s conclusions in prior studies in applying other Information Technology.
Although TAM has been widely applied to study on smart tourism field, but still meet with some limitations such as TAM does not capture the characteristics that are specific to e-tourism. For instance, in the research of Sun et al. (2007), the authors stated that the ultimate goal of online shopping is to entice consumers to shop online, not only be a generic information system. On the other hand, e-tourism is full of uncertainties. It is a reason for the need of adding more factors as antecedents of consumer acceptance. Thus, many studies have been carried out with extension factors.

TAM has been extended by the addition of other constructs such as computer self-efficacy (Compeau & Higgins, 1995), Internet self-efficacy (Igbaria & Iivari, 1995; Eastin & LaRose, 2000; Joo et al., 2000; Hsu & Chiu, 2004a), subjective norm (Taylor & Todd, 1995a; Venkatesh & Davis, 2000; Bhattacherjee, 2000) or playfulness (Liu & Arnett, 2000; Moon & Kim, 2001; Hsu & Chiu, 2004a).

In the previous study, Wixom and Todd (2005) stated that researchers have sought to extend TAM primarily in one of three following ways: (1) by introducing factors from related models, (2) by introducing additional or a iterative belief factors, or (3) by examining antecedents and moderators of Perceived Usefulness and Perceived Ease of Use. On the other hand, Shi (2004) developed an extended TAM model to predict consumer acceptance of online shopping. The author hypothesized User Satisfaction, Web Security & Access Costs, and Perceived Information Quality, Perceived System Quality, Perceived Services Quality are independent variables. Pikkarainen et al. (2004) studied consumer acceptance of Online Banking in Finland in the light of the TAM added with new variables such as security and privacy, perceived enjoyment, information on online banking, and quality of Internet connection.

Pikkarainen et al. (2004) studied consumer acceptance of online tourism in Finland by adopting the TAM added with new variables such as perceived enjoyment, information on online tourism, security and privacy and quality of Internet connection. In the study in the context of Malaysia about internet banking, the author examination of individual’s perceived security and privacy and the Influence of this on their intention to use e-tourism by using an extension of the TAM, Lallmahamood (2000) proposed many previous studies with the reason of extending TAM, in this research, the author added perceived security and privacy as an independent variable beside Perceived Ease of Use and Perceived Usefulness.

Thus, the use of an extended TAM as a theoretical framework is adopted to examine the effect of an external variable on the intention to use e-tourism. In addition to TAM being a widely used and proven model, other reasons for the adoption of this model are because TAM is simple and e-tourism is an information system and an application used by many internet users.

3. Research model

Based on Davis’s TAM (1989) model combined with the results of previous studies by other authors, the team proposed factors that influence the decision to use smart travel applications. People in Hanoi. Ease of use is the degree of personal confidence in using the application that will bring freedom of freedom (Davis, 1989; Davis, 1993). Smart travel application is a new technology application, but this is the application on the phone or the website so users can use the application without much difficulty. Many studies are showing that ease of use has an impact on users’ new technology application (Bendegul Okumus & Anil Bilgihan, 2013; Changsok Yoo, Shinhye Kwon, Hyunsoo Na & Byenghee Chang, 2017; Davis, 1989). Therefore, the author proposes the hypothesis:

\[ H1: \text{Perceived Ease of Use (SD) has a positive effect on the decision to use (QD)} \]

Perceivable usefulness is the perception of a customer concerning the potential advantages of their decision. This fact or has been studied in many studies involving the application of new technologies. This is consistent with previous studies (Bendegul Okumus & Anil Bilgihan, 2013; Changsok Yoo, Shinhye Kwon, Hyunsoo Na & Byenghee Chang, 2017; Davis, 1989). Therefore, the author proposes the hypothesis:

\[ H2: \text{Perceptual usefulness (HI) has a positive effect on use decision (QD)} \]

Information quality and service quality are the two factors that can be considered as deciding whether or not users will use the service of a provider. and services that affect user use of the service (Changsok Yoo, Shinhye Kwon, Hyunsoo Na & Byenghee Chang, 2017; Le Quang Hung, 2017). The following two hypotheses have been added to the proposed model

\[ H3: \text{Information quality (TT) received has the same direction of use decision (QD)} \]

\[ H4: \text{Service quality (DV) has the same direction of use decision (QD)} \]

In addition to the above two variables, awareness of preference is also present in many...
studies on the application of new technology to know whether users feel like using the application (Bendegul Okumus & Anil Bilgihan, 2013; Changsok Yoo, Shinhye Kwon, Hyunsoo Na & Byenghee Chang, 2017)

H5: Perception of preference (UT) has a positive effect on use decision (QD)

The higher the self-control of people, the more they are inclined to use new technology services or the autonomy positively affects the decision to use new technology services. Research on self-control influences previous use decisions (Bendegul Okumus & Anil Bilgihan, 2013). Therefore, propose hypotheses

H6: Self-reliance (LC) works in the same direction as use decision (QD)

Social influence or social norms indicate a user is aware of the other person's point of view about whether the person should use the service or not [1]. Previously, there was also research showing that social influences influence users' decision to use services (Bendegul Okumus & Anil Bilgihan, 2013)

H7: Social influence (social) impact positively with use decision (QD)

The technological barrier is the development of technology that hinders the user's easy use of the application; previous research has demonstrated that technological barriers affect the use of technology services. New (Bendegul Okumus & Anil Bilgihan, 2013)

H8: Technological barrier (CN) has the opposite effect of use decision (QD)

When applying new technology services, what users are quite worried about is that their information is leaked out, so information security factors also play an important role to help researchers apply. New technology completes its research paper (Changsok Yoo, Shinhye Kwon, Hyunsoo Na & Byenghee Chang, 2017)

H9: Information security (AT) has a positive impact on the decision to use (QD)

From the above assumptions, we have the model below:

![Figure 2. The proposed research model](image)

Explain variables in the model has shown in appendix 1.

4. Research Methods

Questionnaire design: The study was conducted in Likert rank using 5 points.

A convenient sampling method was used to survey residents using the smart travel application in Vietnam.

Data were collected by questionnaire, coded and processed by SPSS software, from which the analysis was performed: Descriptive analysis, Cronbach's Alpha test, EFA discovery factor analysis, feedback analysis. convention.

275 questionnaires were given out. Then proceed to receive the answer sheet, clean the information, encode the necessary information in
the answer sheet, enter and analyze the data using SPSS 20.0 software.

The minimum sample size for exploratory factor analysis EFA is \( n = 5m \), where \( m \) is the number of questions in the paper (Hair et al., 1998). For multivariate regression analysis, the minimum sample size is \( n = 50 + 8m \), where \( m \) is the number of independent factors (Tabachnic & Fidell, 1996).

5. Experiment results

5.1. Test the reliability of the scale by Cronbach’s Alpha coefficient

The variables SD, HI, TT, DV, AT, XH, CN, LC, UT, and QD were tested with a scale of Cronbach’s Alpha. In which: LC, QD variable Cronbach’s Alpha coefficient is very high, respectively 0.834; 0.865; The variables HI, TT, DV, XH, CN, AT have Cronbach’s Alpha coefficient, respectively, 0.790; 0.750; 0.775; 0.781; 0.764; 0.760 are greater than 0.7;

The variable SD has a Cronbach’s Alpha coefficient of 0.665 greater than 0.6;

The UT variable has a Cronbach's Alpha coefficient of 0.614 and has an item-total correlation of the UT3 variable <0.3, so it excludes the UT3 variable from the observed variable when the UT variable has a Cronbach's Alpha coefficient of 0.754.

On the other hand, all variables (except UT3) have an item-total correlation > 0.3. Therefore, remove the UT3 observation variable to perform EFA discovery factor analysis.

EFA discovery factor analysis. After the first analysis results:

| Table 1. Analysis results of KMO and Bartlett’s Test |
|-----------------------------------------------------|
| KMO and Bartlett's Test                             |
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy.    |
| Approx. Chi-Square                                  |
| Df                                                  |
| Sig.                                                |
| 0.873                                               |
| 2996.304                                            |
| 406                                                 |
| 0.000                                               |

(Source: SPSS data analysis results)

| Table 2. Rotated Component Matrix |
|-----------------------------------|
| Component                        |
| 1                                |
| 2                                |
| 3                                |
| 4                                |
| 5                                |
| 6                                |
| 7                                |
| 8                                |
| HI2                              |
| .746                             |
| HI1                              |
| .743                             |
| UT1                              |
| .645                             |
| HI3                              |
| .586                             |
| HI4                              |
| .583                             |
| UT2                              |
| .566                             |
| DV3                              |
| .776                             |
| DV1                              |
| .706                             |
| DV2                              |
| .681                             |
| DV4                              |
| .503                             |
| LC2                              |
| .707                             |
| LC3                              |
| .686                             |
| LC4                              |
| .673                             |
| LC1                              |
| XH2                              |
| .795                             |
| XH3                              |
| .752                             |
| XH1                              |
| .685                             |

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KMO index results > 0.5 and Sig. = 0.000 statistically significant, the variables model are correlated.

Table 2 shows that all variables in the groups have values greater than 0.5 and reach reliable values. And for the scale to have statistically significant variables, it is necessary to group:

- Group 1 includes the variables: TT1, TT2, TT3;
- Group 2 includes variables: DV1, DV2, DV3, DV4;
- Group 3 includes variables: AT1, AT2, AT3;
- Group 4 includes variables: SD1, SD2, SD3;
- Group 5 includes variables: LC2, LC3, LC4;
- Group 6 includes variables: H1, H2, H3, H4;
- Group 7 includes the variables: XH1, XH2, XH3;
- Group 8 includes the variables: CN1, CN2, CN3;

Based on the Total Variance Explained table, dividing into 8 groups explains 66.530% of the variation of the model.

All Communalities of observed variables have values greater than 0.4. With threshold criteria of Communalities value > 0.4 is acceptable.

### 5.2. Pearson correlation test results

Based on Cronbach’s Alpha test results and EFA discovery factor analysis remove TT4 variables and create representative factors:

- SD = Mean (SD1, SD2, SD3);
- HI = Mean (H1, H2, H3, H4);
- TT = Mean (TT1, TT2, TT3);
- DV = Mean (DV1, DV2, DV3, DV4);
- AT = Mean (AT1, AT2, AT3);
- LC = Mean (LC2, LC3, LC4);
- XH = Mean (XH1, XH2, XH3);
- CN = Mean (CN1, CN2, CN3);
- QD = Mean (QD1, QD2, QD3, QD4)

#### Table 3. Pearson correlation test results (Correlations)

|       | QD   | AT   | SD   | LC   | XH   | HI   | CN   | T    | DV   |
|-------|------|------|------|------|------|------|------|------|------|
| QD    |      |      |      |      |      |      |      |      |      |
| Correlation | .509** | .366** | .610** | .565** | .620** | .461** | .418** | .567** |
| Sig. (2-tailed) | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| N     | 230  | 230  | 230  | 230  | 230  | 230  | 230  | 230  | 230  |

**Pearson correlation test shows the correlation between each independent variable in the model and the dependent variable. This test is done through the calculation of Pearson’s correlation coefficient. Pearson's correlation coefficient is the covariance of the two variables divided by the product of their standard deviations. Sig value of observed variables SD, HI, LC, DV, AT, CN, TT, XH are less than 0.05 which means that the independent variable correlates the dependent variable. Results of building a single linear regression model.**
Table 4. Model summary results (Model Summary)

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | R Square Change | F Change | df1 | df2 | Sig. F Change | Durbin-Watson |
|-------|---|----------|------------------|---------------------------|----------------|----------|-----|-----|--------------|--------------|
| 1     | .787a | .619 | .606 | .462 | .619 | 44.732 | 8 | 221 | .000 | 1.982 |

a. Predictors: (Constant), CN, SD, DV, XH, AT, TT, LC, HI  
b. Dependent Variable: QD

Adjusted R Square (R square corrected) reflects the influence of the independent variables on the dependent variable. Here, 8 independent variables are included in the effect of 61.93% of the change of the dependent variable, the rest is due to non-model variables and random errors. The Durbin-Watson value of 1.982 has a value of approximately 2, so there is no first-order correlation.

Table 5. ANOVA variance analysis results

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|-------|----------------|----|-------------|---|------|
| Regression | 76.863 | 8 | 9.608 | 44.943 | .000b |
| Residual | 47.245 | 221 | .214 | | |
| Total | 124.108 | 229 | | | |

a. Dependent Variable: QD  
b. Predictors: (Constant), CN, SD, DV, XH, AT, TT, LC, HI

Sig. value of test F is 0.000 < 0.05. Thus, the linear regression model is consistent with the overall.

Table 6. Coefficients results

| Model | Unstandardized Coefficients | Standardized Coefficients | t | Sig. | Correlations | Collinearity Statistics |
|-------|-----------------------------|---------------------------|---|------|--------------|------------------------|
|       | B | Std. Error | Beta | | Zero-order | Partial | Part | Tolerance | VIF |
|       |   |           |     |   |   |           |           |            |     |     |
| (Constant) | -.380 | .245 | -1.555 | .121 | | | | | |
| AT | .121 | .044 | .144 | 2.737 | .007 | .513 | .189 | .019 | .624 | 1.602 |
| SD | .144 | .057 | .116 | 2.510 | .013 | .367 | .169 | .010 | .805 | 1.242 |
| LC | .156 | .053 | .167 | 2.944 | .004 | .610 | .196 | .012 | .537 | 1.861 |
| HI | .233 | .061 | .218 | 3.804 | .000 | .618 | .241 | .015 | .527 | 1.629 |
| DV | .267 | .066 | .219 | 4.053 | .000 | .566 | .259 | .016 | .592 | 1.688 |

(Source: SPSS data analysis results)
a. Dependent Variable: QD

For t-tests of each independent variable, Sig value. less than or equal to 0.05 means that variable has a meaning in the model, whereas Sig. greater than 0.05, that independent variable should be removed. So in this model, only variables AT, SD, LC, HI, XH, DV are retained.

Beta normalized regression coefficients, among all regression coefficients, the independent variable with the largest Beta, that variable has the most influence on the change of the dependent variable. Therefore, the SD variable has the most influence on the change of the QD dependent variable.

After removing TT variable, running the model again, we get the following result: the significant value of the CN variable is 0.346 > 0.05, so we need to remove the CN variable.

After eliminating the CN variable, we get the following result:

| Model | Unstandardized Coefficients | Standardized Coefficients | t | Sig. | Correlations | Collinearity Statistics |
|-------|-----------------------------|---------------------------|---|-----|-------------|------------------------|
|       | B              | Std. Error | Beta |     |             | Zero-order | Partial | Part | Tolerance | VIF   |
| Constant | -.395 | .243 | -.162 | .106 |             |            |          |      |           |       |
| AT     | .119 | .038 | .150 | 3.115 | .002 | 0.513 | 0.222 | 0.141 | .744 | 1.344 |
| LC     | .151 | .053 | .161 | 2.839 | .005 | 0.610 | 0.202 | 0.128 | .533 | 1.875 |
| SD     | .141 | .055 | .114 | 2.548 | .012 | 0.367 | 0.166 | 0.104 | .860 | 1.163 |
| XH     | .216 | .042 | .251 | 5.165 | .000 | 0.563 | 0.295 | 0.191 | .727 | 1.375 |
| HI     | .237 | .060 | .221 | 3.951 | .000 | 0.618 | 0.242 | 0.155 | .549 | 1.822 |
| DV     | .268 | .062 | .219 | 4.333 | .000 | 0.566 | 0.278 | 0.179 | .672 | 1.489 |

a. Dependent Variable: QD

The table shows that Sig values of each boundary are > 0.05, so it is possible to conclude that all variables affect the QD dependent variable.

Specifically, the influence of the factors on the QD is as follows:

QD = 0.150 * AT + 0.111 * SD + 0.161 * LC + 0.221 * HI + 0.251 * XH + 0.219 * DV

Thus, the factors AT, SD, LC, HI, XH, DV have the same directional effect, when increasing by 1 unit, the average value of the QD factor increases by 0.150; 0.111; 0.161; 0.221; 0.251; 0.219 units.

For research projects with a model combined with a questionnaire using the Likert scale, VIF <2 will not have multiple collinearities between independent variables. The above study did not meet the requirement of multicollinearity.

Histogram normalized residual frequency chart

The remainder may not follow the normal distribution for reasons such as: Using the wrong model, the variance is not a constant, the number of residuals is not sufficient for analysis, etc. We need to conduct many different surveys. The simplest way to investigate is to build a histogram of the histogram remainder below.
From the chart shows, a standard distribution curve is superimposed on the frequency chart. This curve has a symmetrical form that fits the graph form of the normal distribution. The mean value is close to 0, the standard deviation is 0.982 close to 1, so we can say the standard approximation distribution. Therefore, it can be concluded that: Assuming the normal distribution of the residual is not violated.

**Figure 3. Histogram normalized residual frequency chart**
(Source: SPSS data analysis results)

**Figure 4. Normalization graph of Normal P-P Plot**
(Source: SPSS data analysis results)

With P-P Plot, the percentile points in the distribution of the remainder will focus into a diagonal line, thus not violating the regression assumption of residual calibration.

The output graph, the distribution points of the remainder if there are forms: Parabolic graph, Cubic graph or other non-linear graph forms, the data violates the assumption of a linear relationship. Count. Looking at the graph, we can see that the standardized residual has not changed in any order against the standardized predicted value. Hence the assumption of linear contact is not violated.

**Figure 5. Scatter Plot chart tests the linear contact assumption.**
(Source: SPSS data analysis results)

6. Conclusion and propose solutions

6.1. Conclusion:
Such data analysis results show that: perceived usefulness, perceived ease of use, social influence, information-related concerns, service quality, and autonomy affect the decision. Intends to use the smart travel application of people in Hanoi but to varying degrees. In particular, the Social Influence factor has the strongest influence on the decision to use Smart travel applications of people in Hanoi and the Factor in the perceived ease of use has the least influence on the decision to use Smart travel application. The Social Influence factor (Social) is the one that has the most influence on the decision to use, which supports the hypothesis of Bendegul Okumus & Anil Bilgihan (2013). The Quality of Service (DV) factor influences the decision to share smart travel applications following the research by Changsok Yoo, Shinhye Kwon, Hyunsoo Na & Byenghee Chang (2017).
and Le Quang Hung (2017). The factors HI and SD influence the decision to use completely consistent with the TAM model (Davis, 1989; Davis, 1993); Bendegul Okumus & Anil Bilgihan (2013), Changsok Yoo, Shinhye Kwon, Hyunsoo Na & Byenghee Chang (2017) with previous IT studies. The influence of Information Security (AT) factor is consistent with the research of Changsok Yoo, Shinhye Kwon, Hyunsoo Na & Byenghee Chang (2017).

6.2. Proposed Solutions
From the research results, it shows that the objective assessments for the development of smart tourism applications in the present contribute to Vietnam towards building a smart city. To develop smart travel applications in Vietnam, the application provider should pay attention, focus on improving the following main factors: Quality of information and services; Perceived usefulness; Social influence; Safety information. As follows:

Firstly, Social Impact factor is one of the factors that greatly influence the decision to use smart travel applications of people in Vietnam, so the application provider should state heighten the importance of this factor by implementing the following solution: (1) Through various channels such as television, social networks (especially social networks because of the access to the period of industrial revolution 4.0, users tend to access information through social networks a lot more), application vendors need to convey the message of the substitution of smart travel apps compared to traditional travel. (2) Create opportunities for customers to increase the opportunity to experience the application before deciding to use it by expanding the free Wi-Fi system (currently on the edge of Hoan Kiem Lake and some places already having Wi-Fi system free). Particularly needed is the impact on pioneering customer groups that use the application to demonstrate technological advancements. When the prophylactic customer group has a good assessment of the usefulness of the application, it is also the best signal to broadcast and transmit the remaining customer groups to use the application.

Secondly, the Quality of Service factor, the results show that this factor has a lot of influence on the decision to use the smart travel application. (1) It is necessary to focus on improving the core benefit of the smart travel application, which is a utility service that can be accessed any time, anywhere, making users feel more convenient and easier than the form. (2) Listen to feedback about the quality of customer applications by different channels such as feedback directly via the web, applications or hotlines, or through research surveys. From there, make appropriate plans to adjust and improve service quality to meet user needs.

Finally, Information Security Concern factor has also been shown to influence users' decision to use smart travel apps. The application that vendors need to build trust with customers that their information provided to application systems is not leaked out.

6.3. Future Research
Future studies may apply the procedure carried out by this study for a larger sample size. Doing this will make the results more general. Besides, the independent variables in this model only explain 61.9% of the variation of the dependent variable. Therefore, future studies can add other independent variables to the model to obtain new results.

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Appendix 1. Explain variables in the model

| I. Perceived ease of use | Refer |
|-------------------------|-------|
| SD1 You can learn how to use the application easily | Davis (1989), Davis (1993) |
| SD2 When interacting with the application you find it easy to understand | |
| SD3 You find the smart travel app easy to use | |

| II. Perceived usefulness |
|-------------------------|
| HI1 You find the use of smart travel apps very helpful for you in providing travel information | Davis (1989), Davis (1993) |
| HI2 Smart travel application increases the efficiency of travel activities, can be used anytime, anywhere | |
| HI3 You find content provided through the smart travel app to be useful to you | |
| HI4 Overall, you consider the smart travel app a valuable service to you | |

| III. Information quality |
|-------------------------|
| TT1 The information provided from the smart travel application is accurate | Changsok Yoo, Shinhye Kwon, Hyunsoo Na & Byenghee Chang (2017) |
| TT2 Information from the supplier about a satisfactory application | |
| TT3 Easily refer to the parameters of the smart travel application through different forms whenever you want (app on phone, web, ...) | |

| IV. Service quality |
|---------------------|
| DV1 The application provider fulfills its commitment to quality of service | Le Quang Hung (2017) |
| DV2 Smart travel application of the provider of many core services | |
| DV3 You think the provider will provide the service as expected | |
| DV4 The smart travel app provider always provides services quickly | |

| V. Perception of preference |
|-----------------------------|
| UT1 You find it interesting to use the application | Bendegul Okumus & Anil Bilgihan (2013) |
| UT2 Smart travel app brings you the favor | |
| UT3 You use the app to kill time | |

| VI. Self-reliance |
|------------------|
| LC1 You can use the app to search for travel information if you've used the same app before | Bendegul Okumus & Anil Bilgihan (2013) |
| LC2 You can use the app to search for travel information if someone guides you to use it | |
| LC3 You can use the app to search for travel information if you have time to try it out | |
| LC4 You can use the application to search for travel information if you can afford the objects of travel such as entrance tickets, food, reservations ... | |
### VII. Social influence

| XH1 | You use the app because your friends also use it and you want to belong to that group |
| XH2 | Using the app also reflects my personality to others |
| XH3 | According to your loved ones, you should use the smart travel app |

Bendegul Okumus & Anil Bilgihan (2013)

### VIII. Technological barriers

| CN1 | You find installing this application difficult for yourself |
| CN2 | Differences from traditional travel forms affect your use of smart travel apps |
| CN3 | The slow performance of smart travel websites or apps affects your decision to use the smart travel app. |

Bendegul Okumus & Anil Bilgihan (2013)

### IX. Concerned about information security

| AT1 | You are afraid your information will be collected |
| AT2 | Logging in to smart travel websites or apps with personal information affects your intention to use the app |
| AT3 | You use virtual credentials to log in to smart travel websites or apps |

Changsook Yoo, Shinhye Kwon, Hyunsoo Na & Byenghee Chang (2017)

### X. Decided to use

| QD1 | In general, the smart travel application of the current application delivery forms makes me feel satisfied |
| QD2 | Using smart travel apps is my right decision |
| QD3 | I enjoy using the 4G smart travel app for my activities |
| QD4 | I will continue to use the smart travel application in the future |

Changsook Yoo, Shinhye Kwon, Hyunsoo Na & Byenghee Chang (2017)