A New Step forward for Tourism Sector in Sri Lanka through Smart Tourism Applications
(Special reference to Kandy Tourism Zone)

L.G.H.R Gamage[1]

Abstract

Smart Tourism Applications present new and better experiences for tourists while improving operating processes in the tourism industry through the use of modern technology. Therefore, the purpose of this research is to explore the tourists' intention to Acceptance of Smart Tourism Applications in the Kandy Tourism Zone according to the UTAUT Model. The main objective of this study is to examine the tourists' intention on accepting smart tourism applications in the Kandy tourism zone according to the UTAUT Model. As the study field, the Kandy tourism zone was selected and this research study adopted a quantitative research approach using a questionnaire to collect data from 400 tourists. The confirmatory factor analysis was used to measure the model and hypothesized relationship between the constructs by using Amos Graphic Version. The results of the study revealed that the proposed four hypotheses were supported and one hypothesis was not supported. Further, it can be concluded that performance expectancy, effort expectancy, facilitating condition, and risk have a significant influence on tourists' intention to accept smart tourism applications in the Kandy tourism zone and social influence has no significant influence on tourists' intention on acceptance of smart tourism applications in the Kandy tourism zone. Therefore, the findings of this paper provide the companies who developed the new applications that are related to the tourism sector with guidance about how to fulfil tourist needs.

Keywords: Acceptance, Smart tourism application, tourists' intention, UTAUT model

1. Introduction

The development of the tourism industry in recent years has largely been attributed to the significant evolution of technologies that have provided a unique experience for tourists, as well as improving efficiency and increasing

[1] Department of social statistics, University of Kelaniya
roshanigamage98@gmail.com

the automation of the tourism sector (Pierdicca, Paolanti, & Frontoni, 2019; Kodithuwakku & Gunarathna, 2018). According to Ivars-Baidal, Celdrán-Bernabeu, Mazon, & Perles-Ivars, (2017) the tourism industry offers new services based on the latest technologies to enhance the travel experience of tourists. In this context, Smart tourism means the application of information and communication technology to develop modern approaches and tools to develop the tourism industry such as the Internet of Things, mobile applications, location-based services, geo-tag services, Virtual Reality, Augmented Reality, social media, etc. (Ye, Ye, & Law, 2020). These advancements in information and communication technologies, in particular, motivate tourism destinations, governments, and practitioners to leverage smart technologies to optimize their decision-making in business planning and enhance the tourist experience (Ye, Ye, & Law, 2020).

In such an environment, it can be pointed out that smart tourism applications are also essential for the tourism industry in Sri Lanka. Because the Internet is the main source of information that influences tourists to visit Sri Lanka (Survey of Departing Foreign Tourists from Sri Lanka, 2017). And also, according to tourists' mode of payment for their necessaries, around 40 % had made their arrangements and made payments directly and around 37 % had made their payments through the internet (Survey of Departing Foreign Tourists from Sri Lanka, 2017). Not only technically but also economically, that tourism was the third-largest foreign exchange earner for the country, preceded by workers' remittances and textiles and garments, which significantly contributed to the Sri Lankan economy (STDA, 2019). Sharpley, (2000) also suggested that many developing countries have recognized the possible contribution that the tourism industry can make to economic development. Therefore, government should implement tourism development strategies as the main driver of economic growth (Fernando, Bandara, & Smith, 2016; Gunarathna, Nga & Chan, 2013).

Therefore, to uplift the tourism industry by utilizing modern technologies in Sri Lanka, various types of applications have already been introduced in Sri Lanka. Examples include GPS, Google maps, Speak and translate apps, booking.com, voice GPS driving, pick me, google earth, etc. and "Locomole" is the first experiential digital platform launched in Sri Lanka as proven by the ministry of tourism development. (Mobitel launches experiential 'Locomole' app for tourists, 2021) This app also makes tourists more with the local

community to make it a unique experience rather than having to depend on a tourism guide (Mobitel launches experiential 'Locomole' app for tourists, 2021). But the inclination of tourists toward these applications is still at a minimum today (Thennakoon & Welagedara, 2017). And also, tourists who visit Sri Lanka have suggested that the tourism industry in Sri Lanka should further enhance the facilities provided for tourism consulting services (Survey of Departing Foreign Tourists from Sri Lanka, 2017). Therefore, it essentially understands it's important for users and why they use such smart applications with low intensive in Sri Lanka.

With this purpose, one of the Technology Acceptance Models is used for this research as the guiding theoretical framework to determine the level of tourists' intention to accept technology's usefulness. Because intention to use is the main indicator of the effective use of an information system (Morris, Venkatesh, Davis, & Davis, 2003) Therefore the model of the United Theory of Acceptance of Use of Technology (UTAUT) is used to measure the tourist intention on the acceptance of smart tourism applications. This model has been proposed by Venkatesh et al. (2003) by combining common points in previous technology acceptance models. The variables focused on the model are Performance Expectancy, Effort Expectancy, Social Influence, facilitating conditions, Perceived Cost, and Risk on tourists' intention to acceptance of smart tourism applications. (Onur & Şükrü, 2016). Venkatesh, Morris, Davis, & Davis (2003) suggested that All of these factors are found to be identified as direct antecedents of the information system-related behavior of a user.

2. Literature Review

In the review of the empirical studies, there is an apparent evidence gap in the prior research. It reveals that some researchers have been done research studies on Tourist adoption of mapping apps: A UTAUT2 perspective of smart travellers (Gupta & Dogra, 2017) and Consumer's Acceptance of Technology-Based Innovations in Retailing (Pantano & Pietro, 2012), Digital economy and tourism impacts, influences and challenges in the tourism industry (Hojeghan & Esfangareh, 2011). User acceptance of mobile apps for hotel booking in Sri Lanka (Nawaz, Kaldeen, & Hassan, 2020).

Further, the use of technology in the tourism industry is intense, and the number of studies examining technology acceptance behaviour is few. Technology acceptance studies can be divided into two areas: 1) Technology

acceptance behaviour of employees in tourism enterprises and 2) Technology acceptance behaviour of travellers (Lai, 2015). In this context, various models have been developed to understand the acceptance and use of technology applications by individuals. These models include the Technology Acceptance Model (TAM), Theory of Planned Behaviour (TPB), Theory of Reasoned Action (TRA), and Diffusion of Innovations. Although the previous models were used by researchers, they were inadequate to explain their predictive capabilities and were developed using limited empirical data (Tan, Lee, Lin, & Ooi, 2017). Therefore, another model the UTAUT was used.

Reviewing the literature grading the Unified Theory of Acceptance, some results indicated that the most significant antecedents of behavioural intentions are habit, facilitating conditions, performance expectancy, and hedonic motivation. It can also be seen that the real usage behaviour was influenced by the travellers' intentions and habits to use the technology applications. However, it was noted that effort expectancy, social influence, and price value had no significant effects on the tourist's intentions to use mapping apps while traveling (Gupta & Dogra, 2017). And also, some studies explore that the effects of performance expectation and perceived risk on the intention to use were 3.9% and 2%, respectively (Onur & Şükrü, 2016). According to these existing findings, there is a contradiction that can be identified. There may be a gap in knowledge of tourists' adoption of smart tourism applications within the context of technology acceptance models.

As well as in the tourism industry, smart tourism apps are merged as one of the most popular channels used by travel-related business operators to build up and sustain their communications and networks with tourists before, during, and after their trips (See, 2018). These applications provide a user with comprehensive travel information and reduce the amount of time that will typically use in searching for such travel-related information. Despite the opportunities to develop the tourism industry through such advanced technological methods, the utilization of these technologies in the major tourist designation in Kandy is at a low level (Thennakoon & Welagedara, 2017). And acquiring comprehensive digital information based on tourism infrastructural facilities is a great challenge for Sri Lankan tourists (Thennakoon & Welagedara, 2017). Therefore, this study has a time value because the development of smart tourism applications can make more tourist

attractions for tourism designation in Sri Lanka by improving the intention of tourists to be attracted to these designations with new technology.

3.1 Research Question

How is the tourists' intention on accepting smart tourism applications in the Kandy tourism zone according to the UTAUT Model?

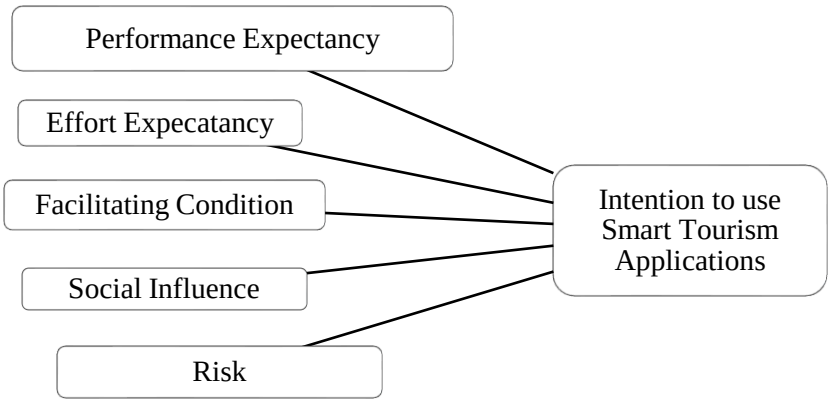
3.2 Research Objective

To examine the tourists' intention on accepting smart tourism applications in the Kandy tourism zone according to the UTAUT Model

4. Methodology

This study is based study on the Unified Theory of Acceptance and Use of Technology (UTAUT). Therefore, it can be identified as Performance Expectancy, Social Influence, Perceived Cost, Facilitating Conditions, Effort, and Risk as independent variables, and intention to use Smart Tourism Applications as the dependent variable. The population of this research was Kandy tourism zone and the unit of analysis were the tourists who visit the major tourist designation in Kandy. Based on population characteristics, used Cochran's equation for identified 404 sample size with a 5% non-response rate, and data were collected through the questionnaire using the cluster sampling method. Because Bansal (2017) suggested that cluster sampling is a sampling technique used when "natural" but relatively homogeneous groupings are evident in a statistical population. Indeed, one version of cluster sampling is area sampling or geographical cluster sampling which can be used Clusters consist of geographical areas (Bansal, 2017). Therefore, the most popular tourist designations in Kandy were used as population clusters. Data were collected through questionnaires. And the questionnaires are constructed via previous research studies and the reliability and validity of the questionnaire were tested using the Cronbach alpha coefficient all the factor loadings were statistically significant and were above the minimum acceptable value of 0.70.

Figure 01: Conceptual Model



All the details about the questions in the questionnaire are given below with the operationalization table.

Table 01: Operationalization table

Variable	Indicators	Short form	Scale	Source
Performance Expectancy (PE)	1. I think Smart Tourism applications will be useful in my tourist activities.	(PE1)	5-point Likert scale	(Venkatesh, Thong , & Xu, 2012)
	2. I think that Smart Tourism applications will increase my chances of achieving things that are important to me in my tourist activities.	(PE2)		
	3. I think using the Smart Tourism applications will enable me to conduct tourist activities more quickly	(PE3)		
Effort Expectancy (EE)	1. Learning how to use Smart Tourism applications for tourist	(EE1)	5-point	(Venkatesh, Thong , & Xu, 2012)

	activities will be easy for me		Likert scale	
	2. My interaction with Smart Tourism applications in touristic activities will be clear and understandable	(EE2)		
	3. I think Smart Tourism applications easy to use in tourist activities	(EE3)		
	4. It is easy for me to become skillful at using Smart Tourism applications in tourist activities	(EE4)		
Social influence (SI)	1. People who influence my behaviour think that I should use Smart Tourism applications in my tourist activities	(SI 1)	5-point Likert scale	(Venkatesh, Thong , & Xu, 2012)
	2. People who are important to me think that I should use the Smart Tourism applications in my tourist activities	(SI 2)		
	3. People in my environment who use Smart Tourism applications in tourist activities have more prestige than those who do not	(SI 3)		
	4. Having Smart Tourism applications in touristic activities is a status symbol in my environment	(S4)		

Facilitating conditions (FC)	1. I have the necessary resources to use Smart Tourism applications in tourist activities	(FC1)	5-point Likert scale	(Venkatesh, Thong , & Xu, 2012)
	2. I have the necessary knowledge to use Smart Tourism applications in tourist activities	(FC2)		
	3. Smart Tourism applications in tourist activities are compatible with other technologies I use	(FC3)		
	4. I think I can get help from others when I have difficulties using the prices/fees of Smart Tourism applications are expensive for me in tourist activities	(FC4)		
Risk (RI)	1. The risk of an unauthorized third party overseeing the transaction is low when using Smart Tourism applications	(RI 1)	5-point Likert scale	(ÇAKIR & ÇİFTÇİ2, 2019)
	2. The risk of abuse of usage information (personal info etc.) is low when using Smart Tourism applications.	(RI 2)		
	3. The risk of abuse of credit card and bank information is low when using Smart Tourism applications	(RI 3)		
Intention to use (IN)	1. I intend to continue using Smart Tourism	(IN1)		

	applications in touristic activities in the future.			
	2. I will always try to use Smart Tourism applications in my touristic life.	(IN 2)	5-point Likert scale	(Venkatesh, Thong , & Xu, 2012)
	3. I plan to continue to use Smart Tourism applications frequently in tourist activities	(IN 3)		

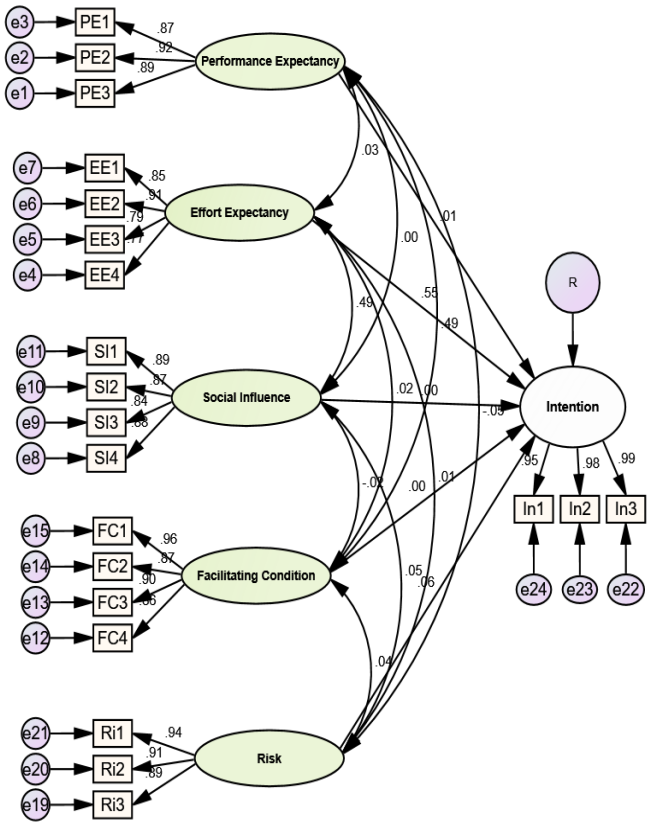
Source: Author Developed, 2022

5. Data Analysis

To simultaneously explore the influence relationships between latent variables, that are relatively abstract in concept and cannot be measured directly. Therefore, Statistical analysis and hypotheses were tested using structural equation modelling based on the optimization technique of the maximum likelihood method.

According to Kline (2005), the structural equation model is divided into two parts: a measurement model and a structural model. This study followed Anderson & Gerbing (1988), two-stage procedure. Firstly, we verified the instrument's reliability and validity by analyzing the measurement model; we then analyzed the structural model. After evaluating the model used path analysis to test the proposed hypothesis.

Figure 02: Evaluation of the structural model



Source: Survey Data, 2022

Table 02: Test results of goodness-of-fit indexes

The goodness of fit index	Observed value
CMIN	2.243
AGFI	0.889
RMESA	0.056
RMR	0.027
TLI	0.968
CFI	0.974
RFI	0.944
NFI	0.954
RNI	0.944
PGFI	0.691
PNFI	0.790
PCFI	0.807

Source: Survey Data, 2022

In an inspection of the fit indices to measure the model, it indicated that DF/ CMIN values were less than 3.0 and RMR values were close to zero. Further NFI, AGFI, TLI, CFI, RFI, RNI, PGFI, PNFI, and PCFI values also range from zero to one. Therefore, it can be concluded that this overall model is acceptable through the significance of above all the fit indices.

5.1 Path Analysis

According to the results of the path analysis, three independent variables in the model; performance expectancy, effort expectancy, and risk were supported model, and other independent variable in the model; social influence not supported to the model.

Table 03: Standardized path analysis results of the structural model

Hypothesis	Path	Estimate	S.E.	C.R.	P	Label	Hypothesis test result
H_1	In <--- PE	.013	.006	2.1	***	par_16	H1 Supported
H_2	In <--- EE	.743	.078	9.587	***	par_17	H2 Supported
H_3	In <--- SI	-.006	.065	-.094	.925	par_18	H3 Reject
H_4	In <--- FC	.093	.053	1.755	***	par_19	H4 Supported
H_5	In <--- RI	.086	.041	2.097	***	par_20	H5 Supported

Source: Survey Data, 2022

Note: Estimate represents the estimated value of the standardized path coefficient; SE represents the standard error term of the path coefficient; CR is the critical ratio, CR = estimate/SE, and a CR value greater than 1.96 indicates that a significance level of 0.05 has been reached; $***$ denotes $P < 0.001$, $**$ denotes $P < 0.01$ and $*$ denotes $P < 0.05$.

6. Findings

Finally, it has been proven that the UTAUT model can be applied to the Kandy tourism zone in Sri Lanka. Moreover, the present study revealed that performance expectancy has positive support for the UTAUT model. This study's findings support previous findings of Gharaibeh M. K., Gharaibeh, Khan, karim, and Alqudah (2021), and Gupta and Dogra (2017) revealed that

performance expectation was found to be an important factor in the UTAUT model.

As well as this study revealed that effort expectancy has positive support for the UTAUT model. The findings are similar to those of prior findings of Gupta and Dogra (2017). But Gharaibeh M. K., Gharaibeh, Khan, Karim, and Alqudah, (2021) noted that effort expectancy does not have a significant effect on the UTAUT Model.

When considering social influence, it has no positive support for the UTAUT model. The results are in line with the previous findings of Onur Cakir and Sukru Firat Ciftci, (2019) and Gupta & Dogra (2017). But Gharaibeh M. K., Gharaibeh, Khan, Karim, and Alqudah (2021) noted social was significant at the level (0.01).

When it comes to the facilitating conditions, it had positive support for the UTAUT model. This study's findings support previous findings of Onur Cakir & Sukru Firat Ciftci, (2019), Gupta & Dogra (2017), Gharaibeh M. K., Gharaibeh, Khan, Karim, & Alqudah, (2021).

Further, in this study risk has positive support to the UTAUT model. This study's findings support previous findings of Pradhan, Oh & Lee, (2018) who confirmed that the impact of the identified risks depends on the characteristics of the tourists.

Further, it can be concluded that tourists' perception of the performance expectancy, effort expectancy, and risk are important factors in fostering the intention to use Smart Tourism Applications in the Kandy tourism zone.

7. Conclusion

Based on the UTAUT model, the present study empirically tested a theory that explains tourists' intention on using smart tourism applications. Since the present study used UTAUT theory in the user accept intention context, the findings provide possible opportunities for future studies on the assessment of various theoretical perspectives to understand technology accept intentions. The study has also contributed to the body of knowledge on the acceptance intention of smart tourism applications because there are scant studies in the Sri Lankan context. Thus, the UTAUT theory can be adapted to investigate the acceptance intention of web-based tourism applications in other institutions with similar conditions. The results can provide a better

understanding of how to plan and implement a successful web-based tourism application.

References

Alalwan, A., Dwivedi, Y., & Rana, N. (2017). Factors influencing adoption of mobile banking by Jordanian bank customers: Extending UTAUT2 with trust. *International Journal of Information Management*, 99–110.

Anderson, J. C., & Gerbing, D. W. (1988). Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach. *Psychological Bulletin*.

Bansal, A. (2017). *Survey Sampling* (Vol. 8). United States: Alpha Science International Ltd.

ÇAKIR , O., & ÇİFTÇİ2, Ş. F. (2019). Investigating Domestic Tourists' Intentions to Use Mobile Tourism Applications within the Context of UTAUT Model. *The New Distribution Area of European Beech (Fagus sylvatica) in Turkey*.

Engel, K. S., Moosbrugger, H., & Müller, H. (2003). Evaluating the Fit of Structural Equation Models:Tests of Significance and Descriptive Goodness-of-Fit Measures. *Methods of Psychological Research Online*.

Fernando, S., Bandara, J. S., & Smith, C. (2016). Tourism in Sri Lanka.

Fornell, C., & Larcker, D. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*.

Frank, Faa, & Jeng Lin. (2012). *Development of Smart Grid in Taiwan.* Smart Grid and AMI Division, National Science Council. Retrieved on 15th September, 2021, from http://www.ee.ncu.edu.tw/~linfj/PD

Gall, M., Gall, J., & Borg, W. (2007). *Educational research: An introduction (8th ed.)*. Boston: Pearson.

Gharaibeh, M. K., Gharaibeh, N. K., Khan, M. A., karim, W. A., & Alqudah, M. K. (2021). Intention to Use Mobile Augmented Reality in the Tourism Sector. *Computer Systems Science & Engineering*.

Gharaibeh, M., & Gharaibeh, N. (2020). An empirical study on factors influencing the intention to use mobile. *Advances in Science, Technology and Engineering Systems Journal*, 1261–1265.

Gunarathna, K.M.K.M.M., Nga, J.L.H. & Chan, J.K.L. (2013). Feasibity of Poverty Alleviation in Sri Lanka Rural Tourism as a Recreation Acitivity. International Journal of Education & Research, 1(2), 1-10

Gupta, A., & Dogra, N. (2017). Tourist Adoption of Mapping Apps : A UTAUT2 Perspective of Smart Travellers. *Tourism and Hospitality Management, Vol. 23*.

Gupta, A., Dogra, N., & George, B. (2018). What determines tourist adoption of smartphone apps? An analysis based on the UTAUT-2 framework. *Journal of Hospitality and Tourism Technology*, 50-64.

Hojeghan, S. B., & Esfangareh, A. N. (2011). Digital economy and tourism impacts, influences and challenges. *Procedia Social and Behavioral Sciences* (pp. 308–316). Iran: Elsevier Ltd.

Ivars-Baidal, J., Celdrán-Bernabeu, M., Mazon, J., & Perles-Ivars, Á. (2017). Smart destinations and the evolution of ICTs: a new scenario for destination management. *Current, Vol. 22*(No.13), 1581-1600.

Kline, R. (2005). *Principles and Practice of Structural Equation Modeling.* USA: Guilford Press, New York, NY.

Kodithuwakku, D.S. & Gunarathna, K.M.L.M.M. (2018). Identify the travel destination attributes that attract international tourists to visit Galle Tourism Zone. Journal of Faculy of Graduate Studies. 6, 179 - 193

Lai, I. (2015). Traveler acceptance of an app-based mobile tour guide. *Journal of Hospitality & Tourism Research, 39(3)*, pp. 401-432.

Locke, E. (2007). The case for inductive theory building. *Journal of Management*, 867-890.

Mobitel launches experiential 'Locomole' app for tourists. (2021, 10 04). Retrieved on 19th November, 2021, from themorning.lk: https://www.themorning.lk/mobitel-launches-experiential-locomole-app-to-boost-tourism/

Morris, M., Venkatesh, V., Davis, G., & Davis, F. (2003). User acceptance of information technology: toward a unified views. *MIS Quarterly, 27*(No. 3), 425-478.

Onur, Ç., & Şükrü, F. (2016). Investigating Domestic Tourists' Intentions to Use Mobile Tourism Applications within the Context of UTAUT Model. *Theory and Practice in Social Sciences*, 570- 579.

Pantano, E., & Pietro, L. (2012). Understanding Consumer's Acceptance of Technology-Based. *Journal of technology management and innovation, 7*(4).

Pierdicca, R., Paolanti, M., & Frontoni, E. (2019). eTourism: ICT and its role for tourism. *Journal of Hospitality and TourismTechnology, Vol*(No.1), 90-106.

Pradhan, M. K., Oh , J., & Lee, H. (2018). Understanding Travelers' Behavior for Sustainable Smart Tourism: A Technology Readiness Perspective. *Sustainability*.

See, S. F. (2018). Tourists' Continued Engagement Intention Towards. In Dogan Gursoy, Siripan Deesilatham, & Pairach Piboo (Ed.), *8th Advances In Hospitality And Tourism Marketing And Management*, (pp. 739- 753). Bangkok, Thailand.

Sharpley, R. (2000). Tourism and Sustainable Development: Exploring the Theoretical Divide. *Journal of Sustainable Tourism*, 1-19.

STDA.(2019). Research and International Relations Division. Colombo 3, Sri Lanka: Sri Lanka Tourism Development Authority.

Survey of Departing Foreign Tourists from Sri Lanka. (2017). The Research & International Relation Division. Sri Lanka: Sri Lanka Tourism Development Authority.

Thennakoon, T., & Welagedara, H. (2017, Sep). Geo-Spatial Information System for Developing Tourism. *Chinese Business Review, 16*(9), pp. 436-446. doi:10.17265/1537-1506/2017.09.003

Venkatesh, V., Thong , J., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending theunified theory of acceptance and use of technology. *MIS Quarterly, vol. 36*, 157–178.

Ye, B. H., Ye, H., & Law, R. (2020). Systematic Review of Smart Tourism Research. *Sustainability*. Retrieved on 16th April, 2020, from https://www. themorning.lk/mobitel-launches-experiential-locomole-app-to-boost-tourism/