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A Study on the Impact of Information and Communication Technology Initiatives on Tourism

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Abstract *Tourism plays an important role in earning foreign exchange for our country. Kerala is the first Indian State to declare tourism as an industry. Tourism plays an important role in earning foreign exchange for our country. Kerala is the first Indian State to declare tourism as an industry. Information and Communication Technology (ICT) has become a major driver of the tourism sector. This study focuses on the development of a survey instrument to know the ICT initiatives taken by the Kerala tourism department and to know the impact of various factors Information Quality (IQ), Ease of Use (EU), Facilitating Conditions (FC), on the ICT Initiatives (II) taken by the Kerala tourism department. Data for the study was collected from 400 domestic and international tourists who visited Kerala. The result indicates that there is a positive impact of ICT initiatives on information quality, ease of use, and facilitating conditions.*

Keywords *Information and Communication Technology (ICT), Tourism, ICT and Tourism*

INTRODUCTION

Tourism plays an important role in earning foreign exchange for our country. In 2021, India received 677.63 million domestic tourists visit, 1.05 million foreign tourist visitors, and the Foreign Exchange Earnings (FEE) from tourism was US $ 8.79 billion (ITS, 2022). The tourism industry's contribution to the Gross Domestic Product (GDP) was US $ 178 billion in the year 2021 (IBEF, 2023). Kerala is the first Indian State to declare tourism as an industry, and the State's tourism model is one of the most liberalised models with the private sector leading tourism development (CPPR, 2018). Income from Kerala's tourism industry contributes to 12 per cent of Kerala's GDP (The Hindu, 2022).

REVIEW OF LITERATURE

The implementation of technology has become an important part of the businesses in the era of globalisation (Ali & Frew, 2013). The drivers for using the internet are reliability convenience, satisfactory experience, and consistency of available information (Ansari, Jain & Kaur, 2017). Technology and Information and Communication Technology (ICT) are prominent because of the wide range of prospects they offer to navigate tourists (Gossling, 2021). Future tourism may offer complex choices, customised experiences, compatible connections, and opportunities, and also highlights possible ways in which tourist site and attraction managers might be able to use new technologies (Hughes & Moscardo, 2019).

It is necessary to engage the tourism stakeholders through marketing and social media activities along with providing technical assistance to use the ICT facilities (Joseph, 2020). Tourism stakeholders should take advantage of digital marketing, mobile applications, online platforms, and e-commerce for marketing tourism (Khare & Sathe, 2021). Social media plays a major role in online marketing and tourists decision-making (Law, Buhalis & Cobanoglu, 2014). ICT can be used as a tool, a powerful instrument for monitoring, forecasting, location identification, online payments, information gathering, and management in the tourism industry (Mahajan et al., 2011).

OBJECTIVES

The specific objectives of this study are as follows:

- To develop a questionnaire to study the ICT initiatives taken by the Kerala tourism department.
- To study the impact of various factors information quality, ease of use, and facilitating conditions on the ICT initiatives taken by the Kerala tourism department.

METHODOLOGY

Sample

The data for this study was collected from domestic and international tourists who visited Kerala through the questionnaire. A total of 400 tourists are selected on the

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basis of both quota and purposive sampling methods. Out of 400 tourists, 372 (93 per cent) are domestic tourists and 28 (7 per cent) are international tourists. The quota per cent 93 and 7 was decided based on the number of average domestic (1,35,22,340) and international (10,25,508) tourists who visited Kerala during the years 2014 and 2018.

Table 1: Population and Sample Size

Year	Domestic Tourist	International Tourist	Total
2014	1,16,95,411	9,23,366	1,26,18,777
2015	1,24,65,571	9,77,479	1,34,43,050
2016	1,31,72,535	10,38,419	1,42,10,954
2017	1,46,73,520	10,91,870	1,57,65,390
2018	1,56,04,661	10,96,407	1,67,01,068
Average	1,35,22,340	10,25,508	1,45,47,848
Quota Per cent	93	7	100
Sample Size	372	28	400

Source: Kerala Tourism Statistics 2018.

Questionnaire Development

The survey instrument used to collect data from the tourists was a structured questionnaire. The questionnaire was developed by adapting the dimensions from two studies (Davis, 1989) and (Thompson, Higgins & Howell, 1991). The five dimensions covered in the instrument are (a) services offered, (b) informational quality, (c) ICT initiatives, (d) ease of use (Davis, 1989), and (e) facilitating conditions (Thompson, Higgins & Howell, 1991).

Table 2: Dimensions Adapted

Dimension	Adapted From
Perceived Ease of Use	Davis (1989)
Facilitating Conditions	Thompson, Higgins & Howell (1991)

Reliability

The reliability of a measuring instrument indicates the extent to which the instrument is without bias and ensures stability and consistency. The stability of the research instrument is the ability to produce the same results at two points of time of the study. "A satisfactory level of reliability depends on how a measure is being used. In the early stages of predictive or construct validation research, time and energy can be saved using instruments that have only modest reliability, e.g., .70" (Nunnally & Bernstein, 1994, pp. 264-265).

Table 3: Reliability

Dimension	Cronbach's Alpha
Services Offered (SO)	.89
Information Quality (IQ)	.93
ICT Initiatives (II)	.93
Ease of Use (EU)	.94
Facilitating Conditions (FC)	.90

The Cronbach's alpha values for all the five dimensions of ICT initiatives perceived by the tourists are more than .70. The overall scale reliability was $\alpha = .97$ with a 95% confidence interval. The reliability analysis shows the statements used to measure the ICT initiatives perceived by the tourists, information quality, ICT initiatives, ease of use, and facilitating conditions are reliable. Hence the questionnaire used for the research is stable and consistent.

Validity

Validity refers to the accuracy of a measure or the extent to which a score truthfully represents a concept (Zikmund et al., 2010). Construct validity provides confidence that the sample measures represent the actual score that exists in the population (Hair et al., 2010). Construct validity is assessed through convergent and discriminant validity (Sekaran, 2009).

Table 4: Construct Validity

Construct	Average Variance Extracted	Construct Reliability
Services Offered (SO)	.62	.89
Information Quality (IQ)	.77	.93
ICT Initiatives (II)	.71	.93
Ease of Use (EU)	.74	.95
Facilitating Conditions (FC)	.76	.91

The convergent validity is estimated with the help of Average Variance Extracted (AVE) and Construct Reliability (CR). An AVE of .5 or higher suggests adequate convergence and the CR of .7 or higher suggests good reliability (Hair et al., 2010). High construct reliability indicates that the measures consistently represent the same latent construct.

Table 5: Discriminant Validity

Construct	SO	IQ	II	EU	FC
SO	**.62**				
IQ	.59	**.77**			
II	.57	.56	**.71**		
EU	.48	.52	.55	**.74**	
FC	.49	.65	.57	.50	**.76**

Note: Diagonal values (bold) are the Average Variance Extracted (AVE). Off-diagonal values are the squared correlation estimates among constructs.

Table 5 indicates that all the AVE values of each construct are greater than the squared correlation estimates among constructs. Therefore, the discriminant validity of all the constructs is established.

RESULTS AND DISCUSSION

Demographic Characteristics of the Tourists

The questionnaire was administered to 400 tourists 62.5 per cent of the tourists are in the age group of 20-34 years of age, and 33 per cent belongs to the age group 35-49 years of age. Of the tourists 54.2 per cent are female and 45.8 per cent are male. Regarding marital status, 54.5 per cent are married and 45.5 per cent are single. 93 per cent of the surveyed tourists are domestic and 7 per cent are international. Furthermore, the tourist's length of stay in Kera represents 43.3 per cent for up to 3 days, 36 per cent for seven days and more and 20.7 per cent for 4-6 days.

Table 6: Demographic Characteristics of the Tourists

Demographic Characteristics	n	%
Age		
20 - 34 years	250	62.5
35 - 49 years	132	33.0
50 - 64 years	17	4.3
65 years and over	1	.2
Gender		
Male	183	45.8
Female	217	54.2
Marital Status		
Single	182	45.5
Married	218	54.5
Type of Tourist		
Domestic	372	93.0
International	28	7.0
Length of Stay		
Up to 3 days	173	43.3
4 - 6 days	83	20.7
7 days and more	144	36.0

Note. n = 400.

Correlation between the Dimensions

Table 7 shows the correlation between the dimensions Services Offered (SO), Information Quality (IQ), ICT Initiatives (II), Ease of Use (EU), and Facilitating Conditions (FC).

Table 7: Correlation between the Dimensions

Dimension	1	2	3	4	5
1. SO	–				
2. IQ	.72**				
3. II	.70**	.70**			
4. EU	.65**	.66**	.70**		
5. FC	.64**	.74**	.70**	.65**	–

**p < .01.

The Pearson correlation between the dimensions used in the research is significant p < .01. There exists a positive correlation between the dimensions. The correlation coefficient between the Information Quality (IQ) and Facilitating Conditions (FC) is r = .74 which indicates a 55 per cent positive relationship.

Further, the correlation between Information Quality (IQ) and Services Offered (SO) is r = .72 which exhibits a 52 per cent positive relationship. Information quality and service offered are in a positive relationship. Information Quality, operating in real-time situations, influence facilitating conditions and better-facilitating conditions can offer better services.

Impact of Various Factors on the ICT Initiatives

The impact of various factors Information Quality (IQ), Ease of Use (EU), and Facilitating Conditions (FC) on the ICT Initiatives (II) taken by the Kerala tourism department was studied using the regression model. The results of the regression model are presented in Tables 9 and 10.

In order to test the multicollinearity between the factors, tolerance statistics and Variance Inflation Factor (VIF) is used. Multicollinearity refers to the correlation among three

or more independent variables which decreases the ability to predict the dependent variable. A tolerance statistic of less than 0.20 and VIF of more than 5 is the indicator of multicollinearity problem (Menard, 1995). The results of the collinearity diagnostics are shown in Table 8.

Table 8: Collinearity Diagnostics of Impact of IQ, EU, FC on II

Variable	Collinearity Statistics	
	Tolerance	VIF
IQ	0.39	2.59
EU	0.49	2.03
FC	0.41	2.46

Table 8 shows that for the regression model, all the tolerance statistics are above 0.20 and VIF values are below 10. Therefore, it is concluded that there is no multicollinearity problem between the factors.

$H_0$1: There is no impact of information quality, ease of use, and facilitating conditions on ICT initiatives.

Table 9: Regression Model Summary of Impact of IQ, EU, FC on II

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	p
.79[a]	.62	.62	.53	217.57	<.001

a. Predictors: (Constant), FC, EU, IQ

The R square value in Table 9 indicates that the model accounts for 62 per cent of the variance in the ICT initiatives taken by the Kerala tourism department $F(3,396) = 217.57$, $p < .001$.

Table 10: Regression Coefficients of Impact of IQ, EU, FC on II

Variable	B	SE B	β	t	p
Constant	.86	.11		7.92	<.001
IQ	.23	.04	.26	5.20	<.001
EU	.31	.04	.34	7.79	<.001
FC	.25	.04	.28	5.88	<.001

Dependent Variable: II.

The regression coefficients (b) indicate that as IQ increases by one unit, the ICT initiatives impacted by .86. The standardized coefficients for the Information Quality (IQ) $\beta = .26$, $p < .001$, Ease of Use (EU) $\beta = .34$, $p < .001$, Facilitating Conditions (FC) $\beta = .28$, $p < .001$ shows the impact of these factors on the ICT Initiatives (II) taken by the Kerala tourism department. It is inferred from the standardized coefficients (β) that EU (.34) is highly impacting the ICT initiatives of the Kerala tourism department followed by FC (.28). Further, the results confirm that there is a positive impact on ICT Initiatives (II) with Information Quality (IQ), Ease of Use (EU), and Facilitating Conditions (FC). Thus, the results of the regression reject Hypothesis $H_0$1.

For quite a long time many forms of Digital Support systems (DSS) are being used by various businesses and other organisations. It usually assists the management in decision-making. But in recent years the use of DSS is extended to customer needs. Besides the management digital support mechanisms are aiding the tourists in planning and decision-making. The Technology Acceptance Model (TAM) derived by (Davis, 1989) from the theory of reasoned action, is applied in many information systems. The theory of reasoned action explains the relationship between the attitude and behaviour of human beings when they are in action. Attitude and subjective norms will lead to the behavioural intention that eventually constitutes behaviour, Behavioural Intention (BI) lead to the use of technology. Davis (1989) defines perceived ease of use as "the degree to which a person believes that using a particular system would be free of effort". From a tourism point of view, it can be adapted as facilitating conditions strengthened and sophisticated by many factors including information quality ensuring ease of use.

CONCLUSION

In conclusion, first, the study showed the development of a survey instrument to measure the ICT initiatives taken by the Kerala tourism department. The reliability and validity of the instrument were also established. The second objective, the impact of various factors information quality, ease of use, and facilitating conditions on the ICT initiatives taken by the Kerala tourism department was proved with the help of multiple liner regression model.

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