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Reliability of ICT Tools adoption among mechanised and motorised fishermen in Kerala marine sector: A case study

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Abstract

Marine fisheries sector plays a significant role in bringing socio-economic development and foreign earnings to the country. Use of new Information and Communication Technology (ICT) has been recognised as a symbol of productivity and welfare enhancement in the sector. It is universally accepted that the role of ICT brings changes to the socio-economic conditions of poor people of the society. A systematic study of ICT tools such as GPS, Eco sounder, Mobile and Wireless set as a whole in Kerala marine fisheries sector among mechanised and motorised fishermen is very relevant at present. The main aim of the study is to test the reliability and validity of each ICT tools for understanding their usage benefits among mechanised and motorised fishing crafts. For this purpose, the study uses a combined model of Unified Theory of Acceptance and Use of Technology (UTAUT) and Cronbach alpha coefficient (C) models, called CUTAUT model. Primary data have been collected from Thiruvananthapuram, Ernakulam, and Kozhikode coastal districts of Kerala with the help of multi-stage random sampling method. The result of the study shows that Cronbach alpha coefficient range from 0.721 to 0.800, which shows more reliability of usage of ICT tools for fishing and relative activities. UTAUT variables, such as performance level, efficiency level, social influence, and facilitating conditions show positive coefficient values for each ICT tools. The study reveals that adoption of ICT tools is influenced by UTAUT attributes, by which efficiency enhancement, more income, life security, and welfare of the fishermen is achieved in the Kerala marine sector.

Keywords: *Mechanised and motorised fishermen, ICT, UTAUT model, Cronbach alpha coefficients.*

Introduction

Socio-economic impact of a new technology is realised only with its successful adoption and utilisation (Ruttan, 2001). Adoption of a new technology takes time and it improves over time. Griliches (1957) and others observed that the rate of adoption of technology as an S-shaped curve where the rate of adoption is the relative speed which with an innovation is adopted by members of a social system. Adoption of technology depends on factors such as relative advantage, comparability, complexity, trialability, and observability (Rogers, 1995). When an adapter arrives at a decision to use a new technology compared to previous, on the basis of such prerequisites leads to an important question. That is, what are the factors that influence maximum adoption

of the technology and how can it be measured. This can be applied to new Information and Communication Technology (ICT) gadgets of Kerala marine sector to understand its role and importance in fishing and communication activities.

Kerala is a small maritime state situated at the south-western end of the Indian peninsula. Fishing and fisheries industry are two important segments of Kerala agriculture sector (CMFRI, 2013; Harikumar and Rajendran, 2007). The marine fisheries sector plays an important role in the economy since more than one million of its population is engaged in fishing industry (CMFRI, 2012). Almost two lakh active fishermen are engaged in this sector (Govt. of Kerala, 2013). Kerala is the third largest contributor of marine fish landings in India, provides 0.671 million tonnes to the total landings of 3.78 million tonnes in 2013 (CMFRI, 2014). The contributions of mechanised, motorised, and artisanal sectors were 68.2%, 30.3%, and 1.5% respectively (CMFRI, 2013) and it has been increasing year by year. Development of technology played an important role in the achievement of present marine status. Kerala had been witnessed several technological transformations from 1950 onwards (Kurien, 1985). Technological development of modern era is ICT tools and their effective adoption in the Kerala marine sector (Jensen, 2007; Srinivasan and Burrel, 2013). ICT is a new technology, used across the fisheries sector from fish assessment and catch to processing and selling (FAO, 2007).

The present ICT tools of Kerala marine sector are; GPS, mobile phone, echo-sounder, wireless set and beacon (Sabu, 2016). GPS is used to find out the locations of crafts and fish shoal. The mobile phone is used to communicate with other fishermen and family members when they are at sea (mobile network accessible area) and the sea shore. Echo-sounder is used to found out the natural and artificial reefs and fish shoal. Wireless set is also used to communicate with other fishermen or authority when they are at deep sea (Shaffril, 2012). Beacon is used when a craft encounters any emergency situation at sea.

CMFRI census report 2010 states that the total number of boats using ICT in Kerala is: GPS - 3288, mobile - 36965 and other ICT tools - 2354 which are 13, 18, and 0.1 per cent with respect to that of the country (CMFRI, 2012). It shows 2nd, 3rd and 6th places to mobile, GPS, and other ICT tools respectively in ranking among other maritime states in India. (CMFRI, 2005) census report measured the electronic tools in a single bundle called electronic gadgets. The total number of electronic gadgets of Kerala in 2005 was 4, 224. The reports showed a significant improvement of the adoption of ICT tools in 2010 compared to 2005 (CMFRI, 2012 and 2005). It also reveals the importance and it's relevance of ICT tools in inshore and offshore fishing.

International and national studies show that ICT tools have a significant impact on income, productivity and welfare of the fishermen. Shaffril (2012) found that, ICT benefited the fishermen in many ways by measuring the utility of GPS, sonar, echo sounder, wireless set and mobile phone among the fishermen of Port Dickson, Negeri Sembilan, Malaysia. He used Unified Theory of Acceptance and Use of Technology (UTAUT) model and generated an accepted Cronbach alpha values ranging from 0.714 - 0.970. Bolong *et al.* (2013) also observed the acceptance and reliability of GPS among the young fishermen where the Cronbach alpha value showed readiness of use of GPS as 0.869 and a behavioural aspect as 0.931. He also supported the positive impact of ICT tools on the fishing industry. ICT played a vital role in bringing the tremendous changes in the life of fishermen and mobile phones, GPS, sonar, radio, television, wireless set and the internet had been benefited the poor very much in fishing and socio-economic life (Omar *et al.*, 2011; Omar and Chhachhar, 2012).

Himmatsinh *et al.* (2008), studied the area of the high productive region, off the Gujarat coast in the northern Arabian Sea using satellite data like Ocean Colour Monitor (OCM) data for chlorophyll concentration and AVHRR data for SST computation to identify the potential fishing zone (PFZ) through GPS. Joshi and Gayatri (2010) observed that the potential of Information and Communication Technology (ICT) tools such as radio, VHF, Walkie-talkie, mobile phone were used in India by creating an appropriate knowledge and organisational support to fishermen. Gangadhar (2011) found out that, the mobile phones led the role as carriers of information, lessen the information asymmetries in fisheries markets, thereby making rural and undeveloped markets to become more efficient. Mary (2011) studied the ICT usage in fishing in Muttom, Kanyakumari district, where she found out that mobile phones played a significant role in fishermen activities.

Abraham (2006) stated that mobile phones have led a significant role in Kerala marine industry and 80% of fishermen were benefited of it. The main beneficiaries of the mobile phone were merchants, transporters and agents. Jensen (2007) found that price dispersion was dramatically reduced from 70 to 15 percent or less and fish waste was reduced 5-8 percent daily due to the use of mobile phones. Mobile phone along with some other tools like GPS and echo sounder play an important role in fishing and other related activities in the sector (Srinivasan and Burrel, 2013). No studies have been conducted to study on other ICT tools (except mobile phone) and to measure the utility of all the ICT tools in the sector. What are the factors that influence the adoption of ICT tools to get its benefits and how it can be measured are also major concerns of present sector. This is the motivation of this study.

In the present study the level of utility and the reliability of ICT tools were measured with the help of Unified Theory of Acceptance and Use of Technology (UTAUT) framework and Cronbach alpha

coefficients to understand the major influencing factors and to measure its effect on the sector. Unified Theory of Acceptance and Use of Technology (UTAUT) model and Cronbach alpha test have been used in several fisheries studies to measure the usage level of ICT tools (Shaffril, 2012; Bolong *et al.*, 2013). Unified Theory of Acceptance and Use of Technology (UTAUT) model is used to understand the usage of information technology (Szajna, 1996; Davis, 1989; Tylor, 1995). Cronbach alpha coefficient (C) is used to measure to internal consistency and estimate the reliability of data (Sijtsma, 2009). This study combines both the models and presents a new model called CUTAUT for understanding the influencing factors of the adoption and importance of each tool to the model as well as to the fisheries sector.

Material and methods

Study areas and selection of sample size

This study is based on both qualitative and quantitative methods. For this purpose, primary and secondary data were collected from three coastal districts of Kerala. The coastal regions were selected with the help of multi-stage random sampling method. First, the coastal districts were systematically segregated into three regions. They are north, south and centre. Secondly, with the help of stratified sampling method, three coastal regions were selected. They are Kozhikode (KZD) from North, Ernakulam (EKM) from centre and Thiruvananthapuram (TVM) from the south. Thirdly, each coastal village was selected randomly from the three coastal districts. They are Beypore from Kozhikode, Munambam from Ernakulam and Pozhiyoor from Thiruvananthapuram (Fig. 1).

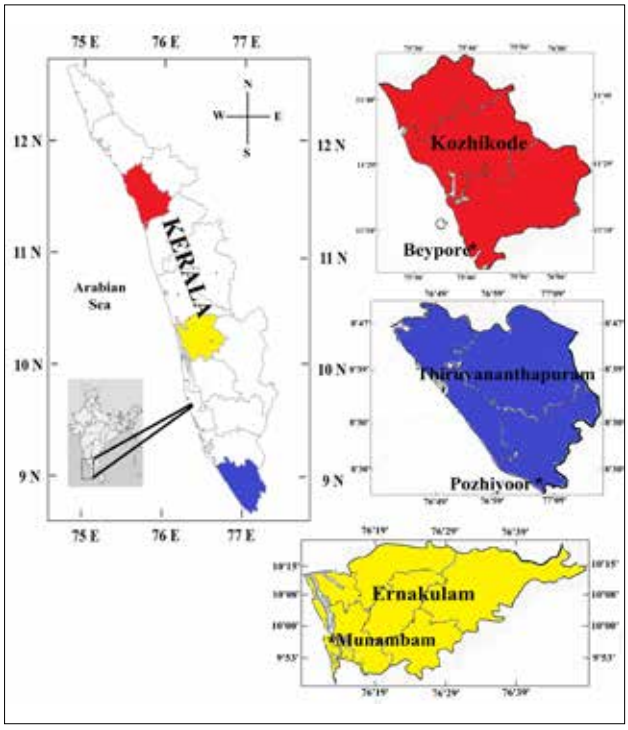

Fig. 1. Map of the study area showing coastal districts and villages (sampled coastal villages with asterisk)

Primary data were collected from the 60 registered multiday mechanised and motorised fishing crafts. The average participant of a questionnaire from a craft is five. Motorised crafts are two types. They are inboard motorised (IBM) and outboard motorised (OBM) crafts. OBM crafts are two types; multiday (MD) and single day (SD). This study concentrates only on multi-day OBM and IBM motorised and mechanised crafts. Because these crafts adopt the maximum number of ICT tools for fishing and communication purposes. Thiruvananthapuram holds the highest number of motorised crafts (2,880) in Kerala and reported no mechanised crafts in this district. A large number of mechanised crafts (1,588) exist in Ernakulam region. Kozhikode coastal district has a large number of both mechanised (1065) and motorised (1,831) crafts (CMFRI, 2012). Features of crafts, gears, and electronic gadgets were also included in the systematically prepared questionnaire.

The questionnaire was divided into three sections. Section 1 consists of basic information of both fishermen and crafts. Section 2 includes the performance of each ICT tools. Section 3 provides the efficiency of each ICT tools. The last two sections were collected with the help of a five-point Likert scale questionnaire. The data were collected during the period of February 2014. The data were systematically analysed with the help of software called, SPSS. The data is collected for calculating Cronbach alpha coefficients (C) to test the reliability and to construct Cronbach Unified theory of acceptance and use of technology (CUTAUT). These methods are explained in the below sections.

Unified Theory of Acceptance and Use of Technology (UTAUT)

Davis (1989) and Davis *et al.* (1989) proposed Technology Acceptance Model (TAM) to address why users accept or reject information technology. The main aim of TA Model is to provide a basis for tracing the impact of external variables on internal beliefs, attitudes, and intentions. It suggests that perceived ease of use (PEOU), and Perceived Usefulness (PU) are the two most important factors in explaining system use (Legris *et al.*, 2003). The modified version of TAM is UTAUT model which incorporated several other factors for measuring the satisfaction level (Table 1).

UTAUT model is one of the important models to understand the usage of ICT. It was strengthened from Technology Acceptance Model (TAM) (Shaffril, 2012). It is a technology acceptance model which was formulated by Venkatesh *et al.*, 2003 (Fig. 2). The model has four main attributes- performance expectancy, efficiency expectancy, social influence and facilitating condition. The performance expectancy and efficiency expectancy are

Table 1. Variables of original technology acceptance model

Variables	Definition/meaning
Performance expectancy-PE	It is defined as the degree to which an individual believes that using the system will help him or her to attain gains in job performance
Effort expectancy-EE	It means the degree of ease associated with the use of the system
Social influence-SI	It shows that the degree to which an individual perceives that important others believe he or she should use the new system
Facilitating conditions -FC	It means the degree to which an individual believes that an organisational and technical infrastructure exists to support the use of the system

Source: Szajna (1996); Davis (1989) and Davis et al. (1989)

used to integrate perceived usefulness and perceived ease of use in the original TAM model (Shaffril, 2012). Demographic factors (gender, age, and experience) and voluntariness of use are included to mediate the impact of the main variables on usage intention (Venkatesh *et al.*, 2003). It is explained in the hypothetical UTAUT model (Fig. 2).

Cronbach Alpha

Reliability can be expressed in terms of stability, equivalence, and consistency. The consistency of data is commonly expressed in the form of Cronbach Coefficient Alpha. Cronbach Alpha is a measure of squared correlation between observed scores and true scores. Cronbach's basic equation for alpha is given by the equation:

$$\alpha = n/(n-1)\ (1-(\sum \sigma v\_i)/v\_test)$$

Where n is the number of questions, V_i is the variance of scores on each question and V_test is the total variance of overall scores (not %'s) on the entire test (Cronbach, 1951). Normally, higher alpha value shows more reliability of the data. There is no commonly agreed cut-off. Usually 0.7 and above is acceptable (Nunnally, 1978).

Results and discussion

Present level of ICT tools in the sector

Kerala faced several agitation movements due to the technological development of crafts and gears in the form of mechanisation and trawling (Kurien, 1985). This did not happen to electronic gadgets when it was introduced in the sector. The present ICT tools help both the mechanised and motorised fishermen in several ways. GPS used by the fishermen is to mark and specify the exact location where the fish is found. It also

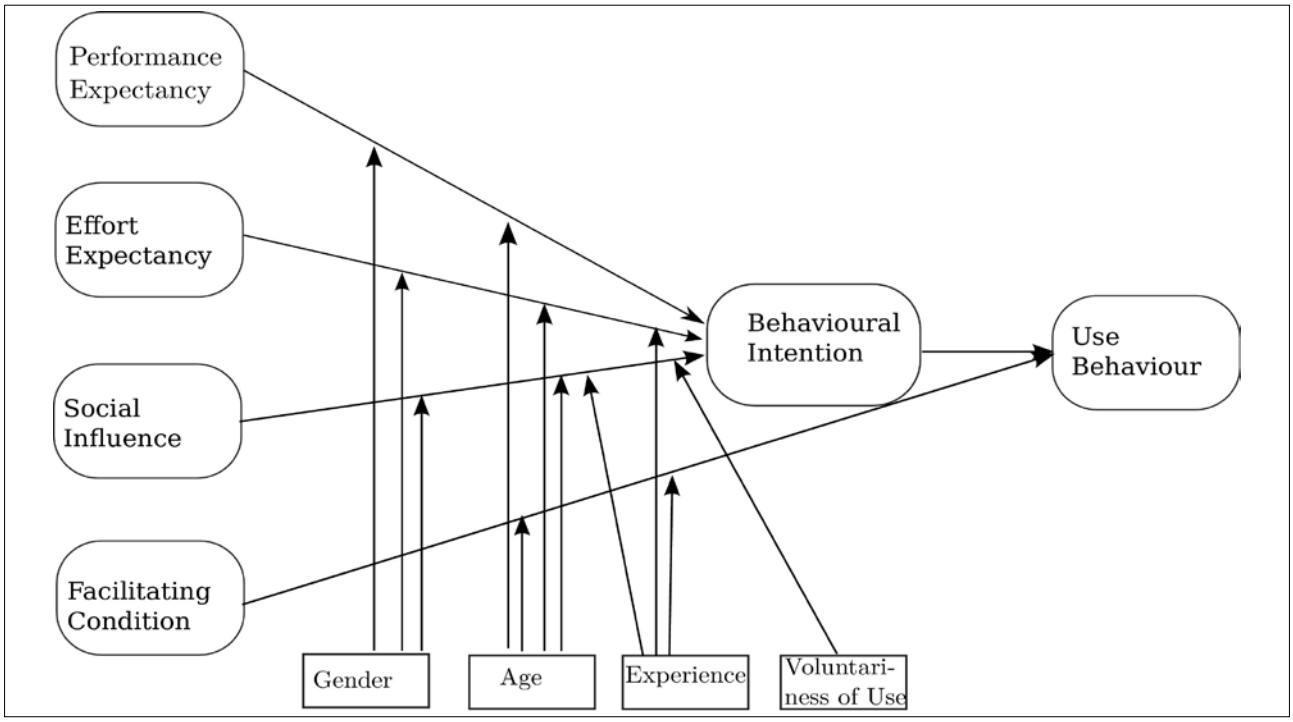

Fig. 2. Hypothesised UTAUT model of the study

helps the fishermen to come back safely at landing centres. Echo-sounder is used along with GPS to pinpoint fish and depth of the sea. Wireless is another important technology to communicate with others when they are at deep sea. It helps inform other fishermen or authority when they face accidents at sea. It also uses for passing serious messages to fishermen from the land. Fishermen use mobile phone to call the agents or other fishermen to know the fish price. Multiday fishermen prefer the mobile phone to call their relatives when they reach landing centres. The majority of crafts uses multiple numbers of mobile phones and wireless sets because of their more utility. It enhances fish productivity/catch and safety of the fishermen and their crafts in the sector. ICT tools help the fishermen to go off-shore fishing without the uncertainty of life. Fishermen started using ICT tools such as GPS, eco-sounder and mobile in 1990. Wireless set and beacon were adopted in 2000 and 2012 respectively.

Almost, 90% of the fish landings are contributed by mechanised and motorised crafts. The contributions of mechanised and motorised sector crafts to the total landing are increasing year by year. The contribution of motorised crafts has increased 9% in 2015 from 2014 (CMFRI, 2015). The census reports (2005 and 2010) also confirm the adoption of new registered motorised crafts and ICT tools. Adoption of mechanised crafts is reduced year by year. Adoption of ICT tools has increased in all the coastal districts in 2010 from 2005 (Fig. 3). It reveals that there exists a significant relationship between the adoption of ICT tools and motorised crafts in the state. ICT tools help the motorised fishermen to go deep sea without the uncertainty of fish resources and lives. It also leads the fishermen to adopt motorised crafts than mechanised. The initial investment of motorised craft is also very less compared to mechanised crafts.

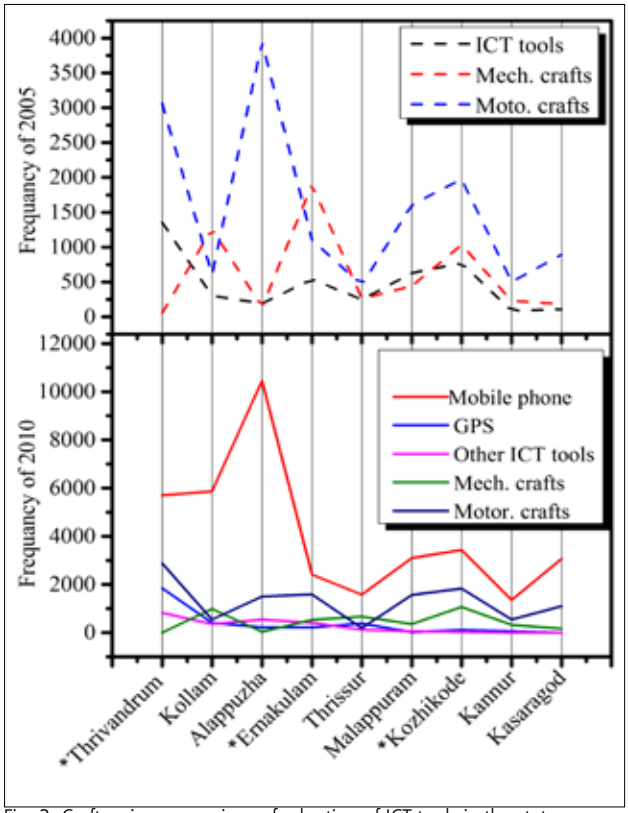

Fig. 3. Crafts wise comparison of adoption of ICT tools in the state (*districts selected for the present study)

Socio-economic profile of fishermen and crafts

Table 2 shows that mechanised and motorised crafts are dominated by 35 to 45 years old fishermen. Kozhikode has youngest fishermen compared to other regions. The majority of the fishermen of the study areas belong to Christianity. It supports the findings of the marine census of 2010. Most of the mechanised and motorised fishermen have the primary education (53%). It helps the fishermen to use the ICT tools in a proper way for fishing. They are also able to disseminate new information of sea resources and climate change with other fishermen. Average income per month of a fisherman is around ₹ 15000. Fishermen get around ₹ 15000- ₹ 20000 in season time i.e. August, September & October and non-season time they get around ₹ 5000 - ₹ 1000 only. Monthly income of mechanised fishermen is high compared to motorised fishermen. This is due to the differences in crafts, gears, and method of fishing. The majority of the fishermen have 10-15 years of fishing experience with ICT tools and their fishing experience is more than 15 years. It helps them to go deep sea and stay for several days. All the mechanised and inboard motorised (IBM) use GPS, Mobile, Eco-sounder, and Wireless set for fishing and safe return. At the same time, OBM uses all ICT gadgets except eco-sounder. But

Table 2. Basic profile of the mechanised and motorised fishermen in the study areas

Profile (N=60)	TVM	EKM	KZD	Total
Male (%)100	100	100	100	
Single (%)	0	5	5	10
Married (%)	100	95	95	90
Age (average)	41	38.5	37	39
Education				
Illiterate	20	5	10	12
Primary	55	70	35	53
Secondary	20	25	50	14
Higher secondary	5	0	5	3
Usage of ICT				
GPS, Echo-sounder, Wireless set and Mobile	15	95	100	70
GPS, Wireless set and Mobile	55	5	0	20
GPS, Echo-sounder, Wireless set, Mobile and Beacon	30	0	0	10
Average monthly income ( )	14600	16100	16650	15783
Average Fishing experience with ICT (in Yrs)	8.6	9	7	8.2

Source: Primary survey, 2014 and compiled from Sabu (2016)

only a few are using beacon along with other ICT tools. Thiruvananthapuram ranks least in the adoption of ICT tools compared to other two regions. This is due to the presence of motorised SD and MD crafts and absence of mechanised boats in the sector. These crafts are owned by traditional small-scale fishermen.

There are three types of crafts existed in the study regions. Thiruvananthapuram has 90% of OBM while 65% and 85% are in Ernakulam and Kozhikode respectively (Table 3). The average overall length (LOA) of IBM, OBM and mechanised crafts are 15.3-18.3m, 9.2-10.6m, and 19.8-22.9 respectively. The average days spent at the sea for fishing is five for OBM and seven for IBM crafts. The majority of fishermen of mechanised crafts (73%) belongs to Kozhikode and Ernakulam. The study observed that many of the fishermen in Kozhikode and Ernakulam are either from south Kerala or Tamil Nadu. There are some IBM fishermen who spent almost one month per trip in Ernakulam and Kozhikode. The average distance of fishing of both OBM and IBM crafts are 100-200 and 200-300 nautical miles respectively. The average distance of mechanised fishing is 200-400 nautical miles (Table 3).

Analysis of CUTAUT Model

The TAM model is the adoption approach which has elements that are similar to diffusion model of Rogers (1995). Rogers (1995) diffusion model helps to understand the nature of adoption of ICT tools in Kerala. The four important elements of diffusion are innovation, communication channels, time, and social system. In this case, ICT tools are the innovation (especially for small-scale motorised fishermen) that perceived as new by the fishermen. The rate of adoption depends on the relative advantage, compatibility, easy to use, trialability, and observability. The study finds out major influencing factors of adoption of ICT tools among fishermen. The attributes of diffusion model are also similar to UTAUT model.

Table 3. Profile of the vessels in study area

Vessel details	TVM	EKM	KZD	Total
Mechanised Boat (%)	5	65	85	85
Motorised Boat (%) (IBM)	5	35	15	18
Motorised Boat (OBM) (%)	90	0	0	30
Total days of work				
5-10 (%)	85	55	70	70
10-15 (%)	15	20	0	12
20-25(%)	0	30	30	20
Average cost of vessel ( )	1052100	5655300	5600000	4102466
Total labours (in No.)	6	10	12	9
Mean size of the boat (in feet)	35	64	65	55

Source: Primary survey, 2014 and compiled from Sabu (2016)

Systematic measurement of these attributes is necessary to understand the usage level among fishermen. To measure the usage level of ICT tools, a combined form of UTAUT and Cronbach alpha coefficients model is developed. The estimated values are shown in Table 4. The study shows a positive relationship between the use of ICT tools and its benefits in fishing. To strengthen this statement, the data has been analysed with the help of the reliability test to measure the consistency of ICT gadgets among the mechanised and motorised fishermen. For this, Cronbach alpha test is done which provides coefficients for each attribute. Higher value of coefficients shows more consistency in the data. There also exists a positive interrelationship between the variables. The atributes of present study are explained in the hypothetical UTAUT model (Fig. 2).

The study shows a positive result of Cronbach coefficients of all variables with the range of 0.721 - 0.800. These values also show a significant relation between the UTAUT variables. The performance level or Perceived usefulness, PU (the degree to which an individual believes that using the system will help him or her to attain gains in job performance) shows the value of 0.741. This research finds out that, overall performances of ICT tools are very useful to the fishermen. GPS ranks highest in the performance level. Echo sounder, wireless set and mobile phone come at 2nd, 3rd, and 4th. Beacons are not effectively used by the fishermen. Efficiency level or Perceived ease of use, PEOU (degree of ease associated with the use of the system) shows the value of 0.746. The study finds out that, mobile phone and GPS (especially handy GPS) are easy to use compared to echo-sounder, wireless set and beacon.

The social influence level or Subjective norm (SN) (The degree to which an individual perceives that important others believe he or she should use the new system) shows the value of 0.794. The communication channel is one of the important factors of social influence. Communication channel includes interpersonal communication where an individual adopts an innovation through the influence of others. Communication gadgets such as mobile phone, TV and radio helped to speed up adoption process in the sector. This study finds out that, adoption of ICT tools were mainly through interpersonal communication among fishermen. Fishermen who use tools communicate with one who does not use. This is called *epidemic effect* (Stoneman, 2002).

A social system that surrounds Kerala fishermen also plays an important role in using ICT tools. Basically, the social system includes the five factors. They are social structure, norms, agents, types of innovation decision, and consequences of innovation (Manueli *et al.*, 2007). The social structure of the Kerala coastal villages is communal based. Adoption of the fishing crafts, gears, and electronic gadgets are depended on agents of the coastal villages. The agents may be the fishermen of same village or

friends from other village or district. They know advantages and disadvantages of all the available technologies in the market. This information is passed to fishermen when they contact the agent. Government institutions like South Indian Federation of Fishermen Societies (SIFFS) and Kerala Swatantra Matsyathozhilali Federation (KSMF) and NGOs also act as agents. The cultural values and norms are not considered as barriers to adoption in the state.

The facility level or Perceived behavioural control (the degree to which an individual believes that an organisational and technical infrastructure exists to support the use of the system) shows the value of 0.733. All the study areas have enough infrastructure facilities of fishing and landing. The infrastructure facilities for disseminating fish resource data and climatic conditions from the innovators to end users are missing in landing centres or sea shores (Table 4).

The usage level also depends on the time of adoption. Time is an essential element in the diffusion theory. The time starts with innovators and ends with end users. This process passes through different stages of adopters in the social system. They are innovators, early adopters, early majority, late majority, and laggards (Rogers, 1995). The mechanised fishermen are considered as the innovators and early adopters of ICT tools while motorised fishermen are the late majority and laggards in the state.

Table 4 shows the consistency data of each ICT tools. It shows that the fishermen get more fish and efficiency with the help of these tools. The most preferred ICT tool in the sector is GPS. Second and third preferred gadgets are wireless sets and mobile phones (Sabu, 2016). In the performance expectancy level, the value of GPS is 0.8 which shows more reliability and importance.

Table 4. Cronbach alpha coefficients of tested variables

Variables	No. of items	Cronbach alpha
UTAUT	33	-
Performance expectancy-PE	-	0.741
GPS	3	0.800
Echo-sounder	3	0.734
Mobile	3	0.718
Wireless	3	0.721
Efficiency expectancy-EE		0.746
GPS	3	0.742
Echo-sounder	5	0.758
Mobile	4	0.766
Wireless	3	0.721
Social influence expectancy-SE	3	0.794
Facility condition performance-FP	3	0.733

Source: Primary data, 2014

The values of 0.734, 0.718, 0.721 of echo sounder, mobile and wireless set respectively show the importance of each tool for fishing and other fisheries related activities. These tools also support for enhancing the efficiency of crafts. The Cronbach alpha coefficients of ICT tools are; mobile phone - 0.766, GPS - 0.742 and wireless set - 0.721. It reveals that the use of ICT tools for deep sea fishing brings a significant change in the life of fishermen and the sector.

The combined model of the UTAUT and Cronbach alpha coefficients is shown in Fig. 4. It also shows that using ICT tools has led a significant role in fishing and life of fishermen in Kerala. The estimated values of performance level, efficiency level, social influence to use and good technical assistance to use of technology among mechanised and motorised lies within an acceptable range. It shows that GPS, echo sounder, mobile phone and wireless sets are successfully accepted by the fishermen and effectively using for fishing and other fisheries related activities.

In addition to the characteristics of diffusion model, Rogers (1995) highlighted the major barriers to the adoption of a technology. They are beliefs, cultural values, education level, cost, living in the same neighbourhood, and working in the same villages. The major constraints of adoption of ICT tools among Kerala fishermen are cost and working in the same villages. The major constraints of effective use of gadgets are lack of training, awareness, and poor infrastructure conditions to disseminate potential fishing zone (PFZ) data. It should be urgently taken care of by the concerned government department, research institutions, and NGOs in the state.

The present study reveals that the success of a newly innovated technology depends on its adoption and effective use. The Kerala marine sector has witnessed this success from one decade onwards. The reliability and consistency of usage of ICT tools are measured by Cronbach alpha coefficient (0.754) and estimated with UTAUT

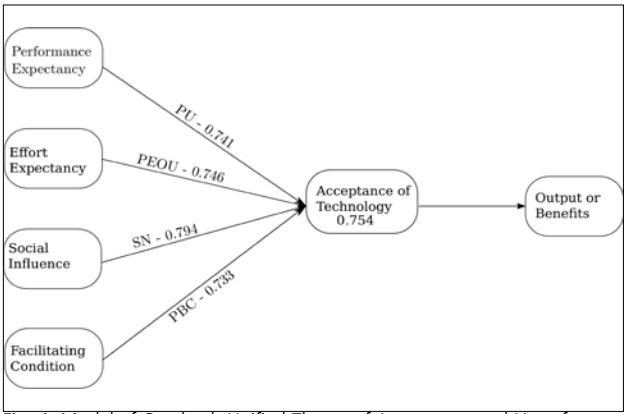

Fig. 4. Model of Cronbach Unified Theory of Acceptance and Use of Technology (CUTAUT) model

technology acceptance model. The estimated values of the UTAUT model showed a positive interrelationship between the performance level, efficiency level, social influence and facility conditions in the selected three regions of Kerala, through which, CUTAUT model was developed to measure the utility of each ICT tools. The study reveals that ICT tools play an important role in increasing fish catch, income, and communication activities in the sector. The main influencing factor of adoption is communication between users and non-users fishermen which comes under the attribute social influence of CUTAUT model. ICT tools-GPS, echo sounder, mobile phone, and wireless sets showed a significant Cronbach coefficient values which predicts the performance level, social influence, effort expectancy, and facilities are the main influencing factors of the adoption. Awareness programme by various schemes and role of Government fisheries departments, various projects of NGOs and participatory role of fishermen would speed up the adoption and utilisation level of the ICT tools in the sector.

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