



UNIVERSITI PUTRA MALAYSIA

***RELATIONSHIPS BETWEEN FACTORS OF ICT ACCEPTANCE AND
USAGE AMONG FISHERMEN IN NORTHERN REGION OF
PENINSULAR MALAYSIA***

ABDUL RAZAQUE CHHACHHAR

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USAGE AMONG FISHERMEN IN NORTHERN REGION OF
PENINSULAR MALAYSIA**

By

ABDUL RAZAQUE CHHACHHAR

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia,
in Fulfillment of the Requirement for the Degree of Master of Science**

April 2014

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DEDICATION

I wish to dedicate this work to my parents and teachers.



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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the degree of Master of Science

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ABDUL RAZAQUE CHHACHHAR

April 2014

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Information communication technology (ICT) is playing very important role in enhancing the capacity building of different communities including fisheries sector by bringing positive impacts on the productivity and competitiveness. ICT promotes efficiency among the fishermen community through saving the time, energy and enhances information interactions and sharing. However, in Malaysian fishermen are still lagging behind in ICT development as compared to other sectors of the society.

The selection of the independent variables for the use of ICT tools was based on the Unified Theory of Acceptance and Use of Technology (UTAUT) model. Moreover, the relationship between independent variables and use of ICT were also sought to determine the factors that have impact on the use of ICT tools by the fishermen community.

Data collection was conducted by survey using self-administered questionnaires. A total of 200 respondents were randomly selected from Perak and Kedah states in Northern region of Peninsular Malaysia based on the highest number of registered fishermen. The data were analysed using Statistical Package for Social Sciences (SPSS) version 18 and the findings were presented using descriptive statistics and Pearson correlation.

Findings of the study indicated that the level use of different ICT tools such as GPS, sonar, radar, wireless set and Echo sounder was moderate among the fishermen while the mobile phone usage was high in the fishermen community.

Moreover, the use of mobile phones has the highest effect on different performance aspects of fishermen whereas echo sounder has the least effect. Moreover, others ICT tools have moderate effects on the performance expectancy of the fishermen. The use of mobile phones has also high effect on the efforts expectancy of the fishermen. However, expect GPS other ICT tools have moderate effects on different effort expectancy parameters of the fishermen. All the social influence variables of the ICT usage on the fishermen community indicated low effects on the fishermen. The facilitating conditions among respondents were moderate about their ownership of different ICT tools and availability of shops that provide sales and services of

these tools. However, other ICT parameters showed low effect on the respondent fishermen.

In conclusion the fishermen should be provided with the adequate information communication technologies along with proper knowledge and skills of the areas. Moreover, there is lack of trainings of ICT for the fishermen at their vicinities. Therefore, it is the responsibility of the government and other related agencies to make arrangements for the easy and cheap availability of ICT for the fishermen. Further, they also should provide regular trainings and workshops on the usage and maintenance of different ICT such as computer, GPS, sonar, wireless set and other technologies to improve their lives and income.



Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

**HUBUNGAN ANTARA FAKTOR PENERIMAAN ICT DI KALANGAN
NELAYAN DI UTARA SEMENANJUNG MALAYSIA**

Oleh

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April 2014

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Teknologi Maklumat dan Komunikasi (TMK / ICT) memainkan peranan yang penting dalam meningkatkan pembangunan kapasiti dalam masyarakat yang berbeza. Penggunaan Teknologi Maklumat dan Komunikasi (ICT) boleh membawa kesan positif kepada produktiviti dan persaingan dalam semua sektor masyarakat termasuk sektor perikanan. ICT meningkatkan kecekapan dalam kalangan masyarakat nelayan melalui penjimatan masa, tenaga dan peningkatan interaksi dan perkongsian maklumat. Walau bagaimanapun, nelayan di Malaysia masih ketinggalan dari aspek pembangunan ICT berbanding dengan sektor lain dalam masyarakat.

Pemilihan pembolehubah bebas bagi penggunaan alat ICT adalah berdasarkan kepada model Teori Penerimaan dan Penggunaan Teknologi (UTAUT). Selain daripada itu, hubungan antara pembolehubah bebas dan penggunaan ICT juga dikenalpasti bagi menentukan faktor yang memberi kesan terhadap penggunaan alat ICT oleh nelayan.

Pengumpulan data dijalankan melalui kaedah tinjauan menggunakan borang soal selidik yang ditadbir sendiri. Seramai 200 orang responden telah dipilih secara rawak daripada dua negeri di kawasan utara Semenanjung Malaysia berdasarkan kepada jumlah nelayan yang berdaftar paling tinggi. Negeri yang terpilih adalah Kedah dan Perak. Data yang diperolehi dianalisis dengan menggunakan Pakej Statistik untuk Sains Sosial (SPSS) versi 18 dan dapatan kajian dipersembahkan menggunakan statistik deskriptif dan korelasi Pearson.

Hasil kajian menunjukkan bahawa tahap penggunaan alat ICT seperti GPS, sonar, radar, set tanpa wayar dan *eco sounder* adalah sederhana sementara tahap penggunaan telefon bimbit adalah tinggi dalam kalangan nelayan.

Tambahan pula, penggunaan telefon bimbit mempunyai kesan yang paling tinggi terhadap prestasi nelayan manakala penggunaan *eco sounder* mempunyai kesan yang paling kurang. Selain dari itu, alat-alat ICT yang lain mempunyai kesan sederhana ke atas prestasi kerja para nelayan. Penggunaan telefon bimbit mempunyai kesan yang tinggi kepada usaha kerja para nelayan. Walau bagaimanapun, peralatan ICT yang lain seperti GPS dan alat ICT yang lain mempunyai kesan sederhana ke atas parameter usaha para nelayan. Kesemua pemboleh ubah pengaruh sosial ke atas penggunaan ICT dalam kalangan nelayan menunjukkan kesan yang rendah.

Kemudahan responden untuk mendapatkan pelbagai peralatan ICT dan kebolehdapatan kedai yang menjual peralatan dan perkhidmatan peralatan adalah pada tahap yang sederhana. Walau bagaimanapun, parameter ICT yang lain menunjukkan kesan yang rendah terhadap responden yang terdiri daripada nelayan.

Kesimpulannya, nelayan perlu dibekalkan dengan teknologi maklumat dan komunikasi yang cukup beserta dengan pengetahuan dan kemahiran yang sewajarnya dalam bidang tersebut. Selain dari itu, terdapat kekurangan latihan ICT dalam persekitaran nelayan. Oleh itu, menjadi tanggungjawab kerajaan dan agensi-agensi lain yang berkaitan untuk menyediakan kemudahan ICT yang murah untuk para nelayan. Mereka juga perlu mengadakan latihan dan bengkel berterusan dari segi penggunaan dan penyelenggaraan peralatan ICT yang berbeza seperti komputer, GPS, sonar, set tanpa wayar dan peralatan teknologi lain untuk meningkatkan taraf kehidupan dan pendapatan nelayan.



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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfillment of the requirement for the degree of Master of Science. The members of the supervisory committee were as follows:

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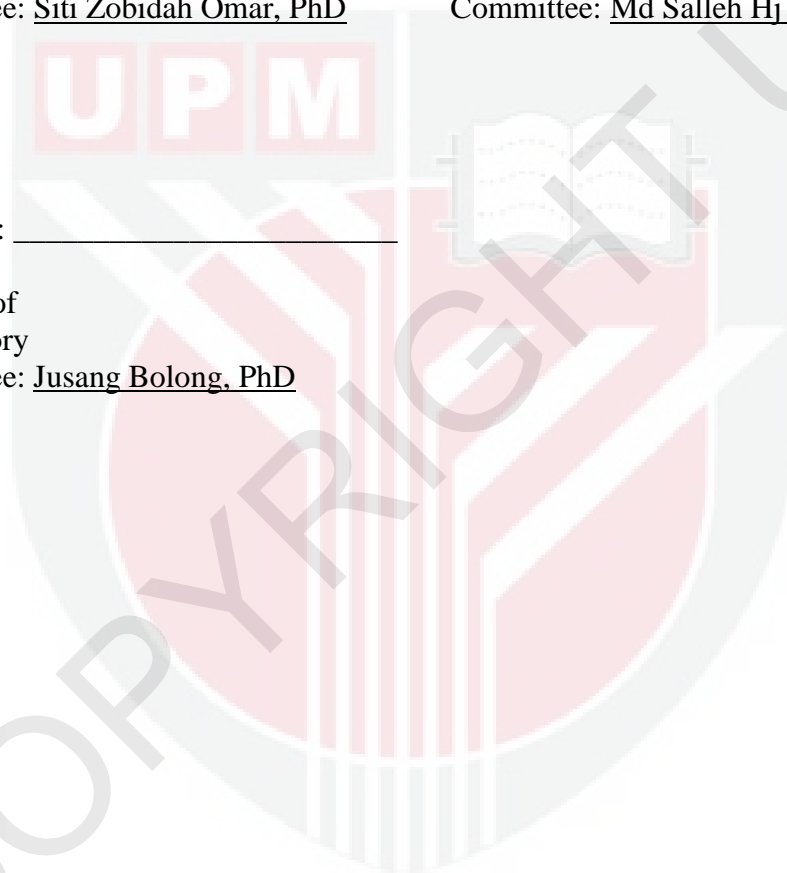


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LIST OF ABBREVIATIONS

EEZ	East Coast Economic Zone
FAO	Food and Agriculture Organization
FFA	The South Pacific Forum Fisheries Agency
GDP	Gross Domestic Product
GIS	Geographical Information Systems
GPS	Global Positioning System
ICT	Information Communication Technologies
IDC	International Development Cooperation
IDC	International Development Cooperation
IVRP	Information Village Research Project
KRIC	Kendra Rural Information Centre
MSY	Maximum Sustainable Yield
NAP	National Agricultural Policy
NGO	Non-Governmental Organization
RUGS	Research Universiti Grant Scheme
SMS	Short Message Service
SPSS	Statistical Package for Social Sciences
TAM	Technology Acceptance Model
UTAUT	Unified Theory of Acceptance and Use of Technology
UTAUT	Unified Theory of Acceptance and Use of Technology
VHF	Very High Frequency
VKCs	Virtual Knowledge Centre
VMS	Vessel Monitoring System
WAP	Wireless Application Protocol

CHAPTER 1

INTRODUCTION

This chapter is comprised of the background of the study regarding the usage of information and communication technology (ICT) among fishermen, problem statement of the study undertaken and the research questions followed by research objectives, significance of study, limitations of the study and keywords.

1.1 Background of the Study

The fisheries sector holds a key position in the economic development of Malaysia. It contributed 2% in GDP and employed labour force. Malaysia has large coastal area that provides enough opportunities of fishing in the country. According to the Department of Fisheries in Malaysia, the fisheries are divided in East and West. The total 89,442 fishermen were registered in 42 fishing districts of 11 states in Western Malaysia. This community has brought dynamic source of fish production in a country, helped in the rural development and has created a lot of employment opportunities for the community (DOF, 2012).

Information communication technologies (ICT) provide new methods and ways of communicating, transferring, enhancing the knowledge and information among different communities. These communities can be farmers, fishermen teachers, lawyers, and doctors. ICT could use to help, support and replace the existing information systems and networks for the development of nations. The term ICT used including television, mobile phone, internet, sonar, radar, telephone, fax machine video voice information system and computer (Warren, 2002). Information and communication technologies are the main source of information for all people. These technologies reduced the gap, saved the time and energy of people (Herselman, 2003).

ICT is one of the most influential and powerful tool for growing the productivity, generating economic growth and facilitating trade, transport and financial issues. Furthermore, ICT can create jobs and improve the quality of life of different societies in the developing countries. ICT can also play an important role to reach people living in the remote areas (Wielicki and Arendt, 2010, Sharifah Mariam, 2004).

The fisheries sector of Malaysia plays a vital role in the economic development of the country. This sector provides dynamic source of animal protein as well as helps in rural development of the country by creating employment opportunities. It contributes about 2% to the national Gross Domestic Product (GDP) and provides direct employment to fishermen community. The fisheries sector is supplying fish as basic needs of nutrition and protein. The production of this sector amounts to more than 1,231,300 tones valued around RM 4 billion and provides direct work to more than eighty thousand fishermen and twenty thousand fish culturists (Annual Fisheries Statistics, 1998).

According to Ali & Abdullah (2010) the Malaysian fishing industry is based either on small-scale or the large-scale commercial operators. Small scale is traditional and the large scale is commercial operator. Small scale means fishing within five nautical

miles from the shore along the coastline of their respective fishing villages. Statistically the fisheries sector is increasing in small and large scale operators in both in its growth cost was 4% to 8%, respectively. The fisheries industry is dignified to remain an important industry hence supported and stabilized the GDP, which was 2% during 1998 similarly remained 2% in 1999. According to the third National Agricultural Policy (NAP3), Malaysia expects fish needs by 2010 was 0.2 million tons. The total production of 0.3 million tons fish in 2001, now the government is taking further steps to increase the fish production through aquaculture. Meanwhile the sea fish productions from catching fish both in the west coast and east coast side's economic zone (EEZ) of Peninsular Malaysia has reached the Maximum Sustainable Yield (MSY). There is a need for growth in the marine fish catch from the vast coastal resources and aquaculture.

1.2 Problem Statement

Information communication technology (ICT) is playing a key role in enhancing the capacity building of different communities. The fishermen community, being one of the biggest communities in Malaysia lacks the ICT facilities in the areas of their working. Studies conducted in Bangladesh and India revealed positive results among the fishermen due to use of mobile phone and other ICT tools as they reduced their risks and uncertainty (Abraham, 2006). In Nigeria and Ghana, information and communication technologies especially mobile phones have played a vital role for the fishermen to get easy access of fisheries information and weather forecasts (Oladele, 2011; Salia, et al., 2011). Studies in different parts of India showed the significant role of ICT especially mobile phone in various fishing activities such communicate with related agencies to get updated information market prices and weather forecasts. Thus the same could help them to carry out their fishing in the sea safely and sell their produce at good price at various markets (Jensen, 2007, Abraham, 2007). Therefore, usage of ICT among Malaysian fishermen can improve their productivity, income and ultimately their living standards (Noor Razzak et al., 2010). Accordingly, the government has taken various steps to encourage the ICT usage in different sectors including fisheries. However, fishermen are facing many challenges and problems in the use of ICT in the areas of their working such as lack of access to different ICT tools and their high costs (Odada et al. 2004). Therefore most fishermen in Malaysia are still relying on the use of traditional old methods to carry out their fishing activities at sea. Moreover, fishermen have no proper knowledge regarding usage and maintenance of different ICT tools and they also face difficulty to find proper market places and experts of ICT to share their problems to get resolved (Omer et al. 2011).

Fowler & Etchegary (2001) revealed that the cost of mobile phones is expensive for the poor farmers and fishermen along with their maintenance. Lack of understanding among the older fishermen to use different ICT tools is also a major hindrance in the use of ICT tools, however, young fishermen showed more expertise and adoptability for the use of different ICT tools especially mobile phones (Roman & Colle 2003; Chakraborty et al. 2005). Therefore, it is emphasized by Bono et al. (2010) to improve the knowledge of fishermen along with development of easy to use and inexpensive software for easy understanding and usage of ICT among fishermen and the same will help fishermen to properly connect with their marketing places and get quick and reliable weather information to ensure their safety at sea. Levy & Banerjee

(2008) also observed that the majority of the farmers and fishermen in Nigeria are living in the rural areas and about 90% of them are illiterate and cannot understand the use of ICT tools properly.

Although there are many obstacles among the fishermen for the use of different ICT tools, studies showed that still ICT is helping fishermen to improve their productivity, income and living standards. In Ghana, 22% of the fishermen were using mobile phones to expand their marketing network to get information on fish prices and other client services. This trend indicated that fishermen are now accepting the importance of ICT tools especially mobile phones in their business as they may find mobile phones easy to purchase and use. However, other technologies such as internet, radar, sonar and wireless systems were not common among fishermen either they were expensive or difficult to use (Salia, et al., 2011). Accordingly, Joshi et al. (2010) stressed to create awareness and guidance among the fishermen for getting related and appropriate information and training about the use of ICT.

1.3 Research Questions

Research questions of this study are:

- 1) What is the level of ICT usage among Malaysian fishermen?
- 2) What is performance expectancy of ICT among fishermen?
- 3) What is efforts expectancy of ICT among fishermen?
- 4) What is the social influence of ICT among fishermen?
- 5) What are the facilitating conditions of ICT among fishermen?
- 6) What are the relationships between performance expectancy, efforts expectancy, social influence and facilitating conditions of ICT and usage of ICT among fishermen?

1.4 Research Objective

1.4.1 General Objective

The general objective of the study is to determine factors of ICT usage among fishermen in northern region of Peninsular Malaysia.

1.4.2 Specific Objectives

1. To identify the level of ICT usage among fishermen in Malaysia
2. To determine the performance expectancy of ICT among fishermen
3. To assess the effort expectancy of ICT among fishermen
4. To determine the social influence of the ICT among fishermen

5. To assess the facilitating conditions of ICT among fishermen
6. To determine the relationships between performance expectancy, effort expectancy, social influence, facilitating conditions and ICT usage

1.6 Significance of the Study

The research areas selected for this study were Perak and Kedah in Northern Peninsular Malaysia based on the highest number of registered fishermen and their contribution towards fish produce of the Malaysia. According to Department of Fisheries, total registered fishermen in Kedah and Perak were 12,945 and 15727, the highest among all states (DOF, 2012). 100 respondents from each state were selected for the study to get their experience regarding the use of different ICT tools in their fishing activities and their effect on different operational variables. Equal number of respondents was selected from two states to get same level of response from the fishermen of two states regarding their experience of using ICT tools. This study is in continuation of previous studies (Omar et al., 2011; Shaffril et al. 2012). To evaluate the effect of government initiatives to promote the use of ICT tools among the fishermen to enhance their fishing activities, income and thus their living standards. It is hoped that the findings would give the contribution of information communication technology in the development of fishermen community. The study would highlight the aspect of the theory in performance expectancy, effort expectancy, social influence and facilitating conditions in the use of ICT. Furthermore, the study would give a better understanding about use of ICT among fishermen. It also indicates the problems and hindrances in use of ICT among fishermen in their areas and at sea. This research provided different information to consider the research agencies and concern authorities to make the priorities in the development of fishermen community. The study would also provide an insight on what kind of ICT tools fishermen use in their daily life. For the researchers and extension workers; these findings would be helpful in developing an appropriate approach in the use of communication technology transfer and training. The main area of the study was selected because the more number of the fishermen were registered in these areas.

1.7 Limitations of Study

The study was conducted using survey in two zones of the marine fisheries sector of Malaysia. In present research two states of west peninsular Malaysia Perak and Kedah were randomly selected. Hence its application would be limited to the sampling population of that area. The scope of this study is also limited to only three main ICT usage factors which include; use of ICT among fishermen, to determine the performance expectancy of ICT, to assess the effort expectancy of ICT, to determine social influence of ICT facilitating condition and the relationships between performance expectancy, effort expectancy, social influence, facilitating conditions and ICT usage among fishermen.

1.8 Keywords

1.8.1 Information and Communication Technology (ICT)

Information and communication technology (ICT) is related with mobile phone, television, radio, GPS, sonar, wireless, radar, all types of audio and video processing, transmission, network based control and monitoring functions technology (Kari, 2007). Nowadays ICT plays vital role in dissemination of informational needs of the Community. By using these technologies ICT can help to increase fishermen's knowledge, increase their literacy level, reduce digital problems, make easy communication process and enhance their security aspects.

1.8.2 Factors of ICT Usage

The main purpose of this study is to analysed the factors which indicated the usage of information and communication technologies for their improvement the performance expectancy, efforts expectancy, social influence and facilitating conditions for the betterment of fishing industry as well as improve their income, safety and information through different ICT tools such as mobile phones, GPS, sonar, radar, wireless and echo sounder.

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