

SMALL BOAT IDENTIFICATION SYSTEM

AZMAN BIN ISMAIL

UNIVERSITI TEKNOLOGI MALAYSIA

SMALL BOAT IDENTIFICATION SYSTEM

AZMAN BIN ISMAIL

A dissertation submitted in partial fulfillment of the
requirements for the award of the degree of
Master of Engineering (Marine Technology)

Faculty of Mechanical Engineering
Universiti Teknologi Malaysia

MAY 2009

To my great Father and Mother, Brothers and Sisters, my Dear Wife and my Lovely Daughter, whose prayers always afforded me the power to accomplish this work. To all I dedicate this work with great respect and love.

ACKNOWLEDGEMENT

All praise to Allah SWT, the Most Gracious and Most Merciful, Who has created the mankind with knowledge, wisdom and power. Being the best creation of Allah, one still has to depend on other for many aspects, directly and indirectly. This is, however, not an exception that during the course of study, I had received so much help, cooperation and encouragement that need to duly acknowledgement.

In preparing this thesis, I was in contact with many people, academicians and practitioner. They have contributed towards my understanding and thoughts. In particular, I wish to express my sincere appreciation to my supervisor Tn Hj Yahya Samian, for encouragement, guidance, friendship and valuable comments in completion of this work. Without his guidance, support and interest, this dissertation would not have been the same as presented here.

A warmest gratitude and special dedication to my father, mother and sister for their understanding, patient and support. A special dedication to my loving wife, Saharah Awang for her support, love and joy. Also for my loving daughter, Amalia Tasnim for her understanding and love.

Then, special gratitude to Tn Hj Jamaluddin Yusuf, Mr. Adam Ali, Mr. Mohd Shukri Munajaf, Mr. Chi Soon Chung, Mr. Mohd Aliff Ahmad, Mr. Fairoz Rozali, and my friends in UniKL MIMET. Besides that, many thanks for my friends who are unnamed here and were involved directly or indirectly for giving their criticism and suggestion.

ABSTRACT

This research work is conducted in order to study and propose an identification system which is able to uniquely represent small boat particulars accurately. The present practice of registration and licensing system used by Marine Department and Department of Fisheries Malaysia, were unable to represent boat uniquely and accurately that not only it will make this system easily to be misused but also does not represent the important parameters of the boats. Also, the use of different standard between these Departments make the present identification system easily manipulated. The study involved collection of small boat data from various resources, present registration and licensing system used by Marine and Fisheries Department, identification system used for ship and boat by other countries and identification system used in other sectors. Based on these inputs and detail study, a more suitable and comprehensive identification system that closely adhered to the international standard has been proposed. The proposed identification system is able to provide all the necessary parameters including; Country, boat manufacturer, year and months of built, hull materials, hull forms, main dimension, gross tonnage, and serial number. This will hopefully provide a unique identification of small boats in Malaysia that enabled the Marine Authority to monitor them effectively. It is also provides good resources for designers and researchers to use the data for their future works.

ABSTRAK

Kajian ini dijalankan untuk mempelajari dan mencadangkan satu sistem pengenalan yang secara uniknya berupaya memberikan data bot secara tepat. Sistem pendaftaran dan perlesenan yang digunakan oleh Jabatan Laut dan Perikanan sekarang tidak dapat memberikan maklumat bot secara unik dan tepat, bukan sahaja menjadikan sistem ini mudah disalahgunakan tetapi ianya juga tidak melambangkan parameter penting bot berkenaan. Malah, penggunaan standard yang berlainan antara jabatan-jabatan ini menjadikan sistem ini mudah dimanipulasikan. Kajian ini melibatkan pengumpulan data bot dari pelbagai sumber, sistem yang digunakan oleh Jabatan Laut dan Perikanan sekarang, pengenalan yang digunakan pada kapal dan bot di negara lain, dan pengenalan yang digunakan dalam sektor yang berbeza. Berdasarkan maklumat dan kajian terperinci, satu sistem pengenalan yang sesuai dan menyeluruh yang hampir memenuhi kehendak piawaian antarabangsa telah dicadangkan. Sistem pengenalan yang dicadangkan ini boleh menyediakan semua parameter yang diperlukan seperti negara, pembuat, bulan dan tahun dibina, jenis bahan dan rekabentuk, dimensi utama, berat kasar dan nombor siri. Ini diharapkan dapat menyediakan satu pengenalan yang unik untuk bot di Malaysia yang membolehkan pihak berkuasa marin mengawalselia dengan berkesan. Ia juga menyediakan sumber yang berguna untuk pereka dan pengkaji menggunakan maklumat tersebut untuk kajian mereka di masa hadapan.

TABLE OF CONTENTS

CHAPTER	TITLE	PAGE
	DECLARATION	i
	DEDICATIONS	iv
	ACKNOWLEDGEMENTS	v
	ABSTRACT	vi
	ABSTRAK	vii
	TABLE OF CONTENTS	viii
	LIST OF TABLES	xii
	LIST OF FIGURES	xiii
	LIST OF SYMBOLS	xiv
1	INTRODUCTION	1
	1.1 Background Study	1
	1.2 Problems Statement	2
	1.3 Objectives	2
	1.4 Scope of Study	3
	1.5 Schedule of Research Activities	3
	1.6 Research Methodology	3
	1.7 Expected Outcomes	5
2	LITERATURE REVIEW	8
	2.1 Introduction	8
	2.2 ISO 10087:2006 Craft Identification Number	8

2.2.1	Main Features	9
2.2.2	Advantages	11
2.2.3	Disadvantages	11
2.3	BoatCode	12
2.3.1	Main Features	13
2.3.2	Advantages	13
2.3.3	Disadvantages	14
2.4	Automatic Identification System (AIS)	14
2.4.1	Main Features	14
2.4.2	Advantages	15
2.4.3	Disadvantages	15
2.5	Vehicle Identification Number	16
2.5.1	Main Features	16
2.5.2	Advantages	19
2.5.3	Disadvantages	19
2.6	Barcode	19
2.6.1	Main Features	20
2.6.2	Advantages	20
2.6.3	Disadvantages	21
2.7	Identity Card (MyKad)	21
2.7.1	Main Features	22
2.7.2	Advantages	22
2.7.3	Disadvantages	22
2.8	Conclusion	23
3	PRESENT BOAT ID SYSTEM IN MALAYSIA	24
3.1	Introduction	24
3.2	Boat Registration and Licensing System in Malaysia	24
3.3	Department of Fisheries (DoF).	28
3.3.1	Registration Number	30
3.3.2	Designated Plate	32
3.4	The Marine Department	33

3.4.1	Ship Registration	34
3.4.2	Official Number	34
3.4.3	IMO Number	36
3.4.4	Boat License	37
3.5	Conclusion	39
4	PROPOSED BOAT ID SYSTEM	40
4.1	Introduction	40
4.2	Selection of Basis ID System	40
4.2.1	Selection Criteria	41
4.2.1.1	Uniqueness of Boat Representation	41
4.2.1.2	Traceability	42
4.2.1.3	Integration With Other System	42
4.2.1.4	Duplication of ID	42
4.2.1.5	Standardization	43
4.2.2	Analysis	43
4.3	Proposed ID System	44
4.3.1	Country Code	45
4.3.2	Manufacturer Code	46
4.3.3	Month of Built	48
4.3.4	Year of Built	48
4.3.5	Type of Hull Materials	51
4.3.6	Type of Hull Forms	51
4.3.7	Main Dimensions	52
4.3.8	Gross Tonnage (GRT)	54
4.3.9	Serial Number	55
4.4	Verification Process	55
4.5	Conclusion	58
5	DISCUSSION AND CONCLUSION	59
5.1	Discussion	59
5.2	Suggestion for Future Research Works	60

5.3	Conclusion	61
-----	------------	----

REFERENCES	62
-------------------	-----------

LIST OF TABLES

TABLE NO.	TITLE	PAGE
1.1	Schedule of activities	6
2.1	Codes representing month of manufacture	10
2.2	Codes representing year of manufacture	10
2.3	Standard Comparison	16
2.4	World Manufacturer Identifier	17
2.5	WMI and Country	18
2.6	MyKad format	22
3.1	Total of licensed boat in Malaysia for 2008	25
3.2	Registration format for Perak, Pulau Pinang, Pahang, Kedah and Terengganu	31
3.3	Total of ship registry year 2001-2007	35
4.1	Comparison between ID systems	44
4.2	Boat Identification Number (BIN)	45
4.3	Country code	46
4.4	Manufacturer code	47
4.5	Month of built	48
4.6	Year of built	49
4.7	Year 2000 till 2229	50
4.8	Types of hull materials	51
4.9	Types of hull forms	52
4.10	Decimal values	53
4.11	Verification status	55
4.12	Details of boat and BIN for verification	57

LIST OF FIGURES

FIGURE NO.	TITLE	PAGE
1.1	Research Methodology	7
2.1	Craft Identification Number	9
2.2	Boatcode format	12
2.3	UPC and EAN format of barcodes	20
2.4	Classification of some biometric traits	21
3.1 (a) and (b)	Unregistered boat at the Kg. Baru Jetty	26
3.2 (a) and (b)	Unregistered boat at the Lumut Jetty	27
3.3 (a) and (b)	C2 is marked on the superstructure	29
3.4	Registration format for sampan in Perak	30
3.5	Registration format (i.e PAF 4570) for commercial fishing vessel	32
3.6	The designated plate	33
3.7	Official number welded on the bulkheads in engine room.	35
3.8	IMO number attached onto the superstructure	37
3.9	License number for passenger boat	38
3.10	“K” represents Cargo Boat	38

LIST OF SYMBOLS

ID	~ Identification
GRT	~ Gross tonnage
ISO	~ International Standard Organization
CIN	~ Craft Identification Number
REV	~ Register of Encumbered Vehicles
VIN	~ Vehicle Identification Number
AIS	~ Automatic Identification System
IMO	~ International Maritime Organization
SOLAS	~ Safety Of Life At Sea
VTS	~ Vessel Traffic Service
ECDIS	~ Electronic Chart Display
WMI	~ World Manufacturer Identifier
VDS	~ Vehicle Descriptor Section
VIS	~ Vehicle Identifier Section
UPC	~ Universal Product Code
EAN	~ European Article Numbering
MyKad	~ Identity card for Malaysian
MD	~ Marine Department
DoF	~ Department of Fisheries
MMEA	~ Malaysian Maritime Enforcement Agency
MSO	~ Malaysian Shipping Ordinance
ON	~ Official Number
L	~ Length
B	~ Breadth

D	~ Depth
BIN	~ Boat Identification Number
IANA	~ Internet Assigned Numbers Authority
T	~ Draft
RFID	~ Radio Frequency Identification

CHAPTER 1

INTRODUCTION

1.1 Background Study

In 2008 alone, there were 3117 boats licenses that were issued in Malaysia [1]. However, except for business purposes, most of boats were licensed or registered on voluntarily basis. For this reason, many boat owners who may acquire more than one boat take this opportunity to register only one boat, and at the same time apply this license number to another boat. Hence, the total number of 3117 is not actually representing the real amount of boat in operating in Malaysia waters as there were still many unregistered boats that can be easily seen at the jetty.

On the other hand, the present registration and licensing system used is not representative enough. This registration and license number can be easily be duplicated not only to other similar boat but also to different types of boats. The present registration system or license numbers gives very little information about the boat thus makes it easy to be manipulated and misused. There was several reported case of misuse of this identification number among the boat owner [2].

Therefore an identification system needs to be established in order to prevent the duplication of identification number. There is a need to propose a better

identification system that is able to represent the boat details more precisely. These details could include important information such as length, breadth, depth, GRT etc were considered to be included in order prevent the duplication of identification.

1.2 Problems Statement

In carrying out this research work, the following issues will be addressed;

1. What is the method used in the present identification systems of boats in Malaysia?
2. How effective is the present ID systems to represent the boat?
3. If improvement is needed, what will be a good identification system to be developed?

1.3 Objectives

The objectives of this project are as follows;

1. To determine the present status of identification system used to represent boats in Malaysia.
2. To propose a more comprehensive identification system to be used in future.

1.4 Scopes of Study

The scopes of this project are as follows;

1. Small boats built and operate in Malaysia.
2. Boat length of 24m and below.
3. All type of construction materials.

1.5 Schedule of Research Activities

In order to carry out this project effectively, the research activities are scheduled as shown in Table 1.1. The research work consists of 14 task activities which include; conduct background study, study rules and regulations, prepare questionnaires, interview marine authorities (Marine and Fisheries Department), determine problems and improvements, conduct site visits, gather more information from books and journals, refer system used in other countries, make comparison study, propose an identification system, conduct verification survey, and do further improvement.

1.6 Research Methodology

More details study is required to produce a proper identification system. Most of the information is gathered from the internet, especially from Marine Department, and Fisheries Department Websites. From this information, it will give the overview background of the current situation.

First and foremost, there must be an understanding about the regulation involved regarding boat registration and licensing in Malaysia. It is a need to analyse and understand this regulation as this provision is governing the act of registration and licensing of marine vessel in Malaysia. The regulations that need to be viewed are Malaysian Shipping Ordinance 1952 [3], Boat Rules 1953 [4], Fisheries Act 1985 [5] and ISO Standard, ISO 10087:2006 Craft Identification Number [6].

A set of questionnaire is then produced for interview session which related to Marine Authorities such as Marine Department and Fisheries Department as they are the major player in maritime industry in Malaysia. This interview can be defined as qualitative survey where are only selected respondents will be interviewed and these represent the actual status of marine industry in Malaysia. This will give a clear view regarding present ID system used in Malaysia. From interview session, the problems and area that need any improvement can be determined.

Several site visits will be done to nearby marinas and jetty for collecting some boat photos, actual statistic of registered and unregistered boat, and meeting with boat owners in having their views.

More literature review is conducted from reliable resources such as books, journals, magazine etc to gain more information and ideas. All relevant data is recorded thoroughly.

The system used by other countries is also referred as extra information and comparison between systems were made. The gathered information is compared before a new identification system is developed. The ID format will then be proposed.

This proposed ID will then be distributed to the marine experts for comments and verification. Their comments will be recorded for any further improvement, if any. These steps are shown in the flowchart in Figure 1.1.

1.7 Expected Outcomes

It is expected that this research work will be able to provide;

1. A comprehensive ID system to represent a small boat uniquely and accurately.
2. The ID system that can be used to monitor small boat effectively due to uniformity / standardization without any conflict.

Besides that, this will provide some benefits to industry in the marine in a way more standard registration system can be implemented.

Table 1.1 Research activities

No	Research Activities	Sem 1 Session 2008/09					Sem 2 Session 2008/09						
		July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Mei	
1	Conduct background study												
2	Study Rules and Regulations												
3	Prepare Questionnaire												
4	Interview Marine Authorities												
5	Determine problems and improvements												
6	Conduct Site Visit												
7	Gather more information from books, journals etc												
8	Refer System Used in Other Countries												
9	Make Comparison												
10	Proposed an ID System												
11	Verification Survey												
12	Do Further Improvement (if any)												
13	Thesis Writing												
14	Presentation and Submission												

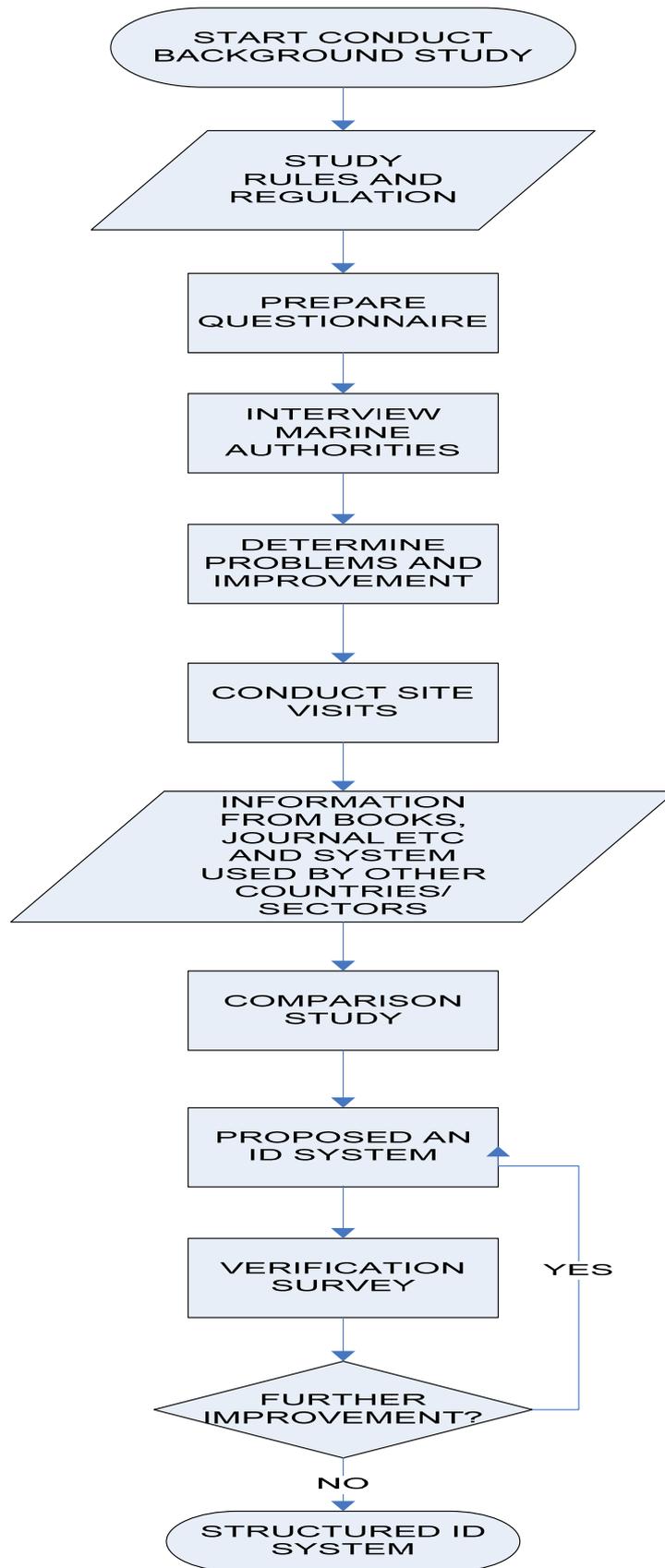


Figure 1.1 Research Methodology.