

DEVELOPMENT OF SPAKE'S MAINTENANCE MODULE FOR MINISTRY OF
DEFENCE MALAYSIA

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DEFENCE MALAYSIA

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This thesis is submitted to fulfill the partial requirement of the Computer Science (Real
Time Software Engineering) Master Degree Award

Centre for Advanced Software Engineering
Universiti Teknologi Malaysia

SEPTEMBER, 2004

*Especially dedicated to my lovely wife, Nurulhayati Md. Yusop.
To my beloved parents Tuan Syed Yahya Kamal Syed Bany and Pn. Khairiah Said.
To my wonderful parents in law Hj. Md Yusop Ayub and Hjh. Hamidah Hamid.
To my loving brothers and sisters.*

For their love and best wishes.

ACKNOWLEDGEMENT

In the name of Allah the Beneficent the Merciful, I am thankful to Allah Almighty for giving me courage, patience and strength to accomplish my thesis.

I would like to express my profound gratitude to my Academic Mentor, Associate Professor Zailani Mohamed Sidek for always delivering his support and guidance towards this thesis. Besides, a lot thanks to Miss Norizan Md. Zain @ Ali as Industrial Mentor who has given guidelines in this project. Their comments and advice helped me a lot in this project.

Not forgetting my lovely wife and beloved parents, for their prayers, support, patience and love during my good and bad times. Their hardworking and trustworthy natures, which have accomplished many recognized achievements, have always influenced me to perform my very best.

Also thanks to my fellow postgraduate students for their views and tips are useful indeed and lastly thanks to all participating individuals who are involved directly or indirectly in supervising, giving support and guidance during this project.

ABSTRACT

Sistem Pengurusan Alat Komunikasi dan Elektronik (SPAKE) was developed to mitigate the Ministry of Defence Malaysia especially for Royal Signal Regiment in order to record, filter, process and search the data that have been stored in the Database Management System (DBMS). This system has mitigated the user where every job requirement forms, reports and information for certain data can be produced and printed via user computers. Before the system was developed, traditional method done by using lots of forms and reports resulted in less effective management because users need to use lots of storing files to store all the forms and reports. Furthermore, users have difficulties to search the past data. More than that, this manual method of course delays the job transferring between army units around Malaysia. Following the government's vision to achieve electronic government or e-Government which is one of the flagship application for vision 2020, Ministry of Defence Malaysia has take the brilliant initiative to realize this vision. This transformation of job management will bring deep effect for the department especially in reducing the human power, cost and time. Besides, this change will also drive the department management and administration to be more efficient and systematic.

ABSTRAK

Sistem Pengurusan Alat Komunikasi dan Elektronik (SPAKE) dibangunkan bagi memudahkan Kementerian Pertahanan Malaysia khususnya Rejimen Semboyan DiRaja untuk merekod, menyaring, memproses serta mencari data yang tersimpan di dalam Sistem Pengurusan Pangkalan Data (DBMS). Sistem ini juga memudahkan pengguna di mana segala borang permohonan tugas, laporan dan maklumat mengenai sesuatu data dapat dihasilkan serta dicetak secara terus menerusi komputer pengguna. Sebelum sistem ini dibangunkan, kaedah tradisional yang menggunakan pelbagai jenis borang dan laporan menjadikan pengurusan tidak efektif kerana ianya memerlukan fail simpanan yang banyak untuk menyimpan segala borang dan laporan. Ia juga menyusahkan pengguna untuk mencari data-data yang lepas. Selain itu, kaedah manual ini tentunya membawa kepada kelewatan sesuatu tugas disampaikan diantara unit-unit tentera di seluruh Malaysia. Sejajar dengan hasrat kerajaan untuk menjayakan kerajaan elektronik atau e-Government yang termaktub di dalam salah satu aplikasi perdana Wawasan 2020, pihak Kementerian Pertahanan telah mengambil inisiatif yang bijak untuk merealisasikan hasrat tersebut. Transformasi pengurusan kerja sebegini tentunya memberi kesan mendalam kepada jabatan terutamanya dalam mengurangkan tenaga kerja, kos dan masa. Selain itu, perubahan ini juga pasti membawa kepada pengurusan dan pentadbiran yang lebih cekap dan sistematik di dalam jabatan itu sendiri.

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LIST OF ABBREVIATIONS

API	-	Application Programming Interface
CORBA	-	Common Object Request Broker Architecture
DBMS	-	Database Management System
EMESYS	-	Electrical Mechanical Engineering System
ERD	-	Entity Relationship Diagram
E-Office	-	Electronic Office
GIS	-	Geographical Information System
HTML	-	Hyper Text Markup Language
ICT	-	Information Communication Technology
IDIS	-	Imatera Digital Image Services
IT	-	Information Technology
JAS	-	Job Applying System
JCA	-	J2EE Connector Architecture
JNI	-	Java Native Interface
JRE	-	Java Runtime Environment
J2EE	-	Java 2 Platform Enterprise Edition
KUTKM	-	Kolej Universiti Teknikal Kebangsaan Malaysia
LJTNet	-	Lembaga Jurukur Tanah Online
Online		
ODBC	-	Open Database Connectivity
OMT	-	Object Modeling Technique
OOP	-	Object Oriented Programming
OOSE	-	Object Oriented Software Engineering

LIST OF ABBREVIATIONS (CONT...)

RAD	-	Rapid Application Development
RUP	-	Rational Unified Process
R&I	-	Receive and Issues
SISPIK-TD	-	Sistem Pengurusan Informasi Komputer – Tentera Darat
SPAKE	-	Sistem Pengurusan Alat Komunikasi dan Elektronik
SPTP	-	Sistem Pemantauan Tanah Persekutuan
SRS	-	Software Requirement Specification
STD	-	Software Test Description
UML	-	Unified Modeling Language
WWW	-	World Wide Web
XML	-	Extended Markup Language

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CHAPTER I

INTRODUCTION

1.0 Introduction

In this chapter, *Sistem Pengurusan Alat Komunikasi dan Elektronik* or SPAKE is described. It involves the problem statements that bring to the existence of SPAKE system. More than that, the organization background, project objectives and scopes are also been discussed in this chapter.

1.1 Project Overview

Sistem Pengurusan Alat Komunikasi dan Elektronik (SPAKE) or translated as Electronic and Communication Equipment Management System is a web-based system that is developed as a sub system for the integrated *Sistem Pengurusan Informasi Komputer – Tentera Darat* (SISPIK–TD). SISPIK–TD is proposed for the *Rejimen Semboyan DiRaja* (RSD) or translated as Royal Signal Regiment of Malaysian Army. SISPIK-TD is a web-based application that consists of two sub systems which are *Sistem Pengurusan Alat Komunikasi dan Elektronik* (SPAKE) and *Electrical Mechanical Engineering System* (EMESYS). Generally, the main idea of the system is to enhance the

Royal Signal Regiment administration and management operations. The system will contribute to the efficiency and effectiveness in Royal Signal Regiment management.

There are five modules involved in SPAKE development while seven modules are involved in EMESYS. The modules in SPAKE sub system are:

- i. *Modul Perolehan* (Acquisition Module)
- ii. *Modul Senggaraan* (Maintenance Module)
- iii. *Modul Pemeriksaan Pakar* (Specialist Inspection Module)
- iv. *Modul Informasi Data dan Statistik* (Statistics and Data Information Module)
- v. *Modul Sistem Pengurusan* (Administration System Module)

The following are the brief descriptions for each module provided in SPAKE system:

- i. ***Modul Senggaraan*** is the most important module in SPAKE system. All information about spare part equipment and repaired equipment will be recorded in this module. It consists of equipments maintenance, defect tracking, record keeping of maintenance job and usage of spare part record in technical store.
- ii. ***Modul Perolehan*** consists of data management for equipment in the Semboyan Department. The module is also used for archiving the data for all equipment received and distribution among Malaysian Army bases.
- iii. ***Modul Pemeriksaan*** for recording all inspection that has been done to the communication equipment. All inspection recorded will be used by higher authorities to make a summary for all communication equipment.

- iv. *Modul Informasi Data dan Statistik* for collecting and distributing reports within a specific format that has been introduced by the administration.
- v. *Modul Sistem Pengurusan* for managing all password and user ID to ensure the system's security.

This module is a main functionality of SPAKE subsystem. The sub modules for every module in SPAKE system are shown in Figure 1.1.

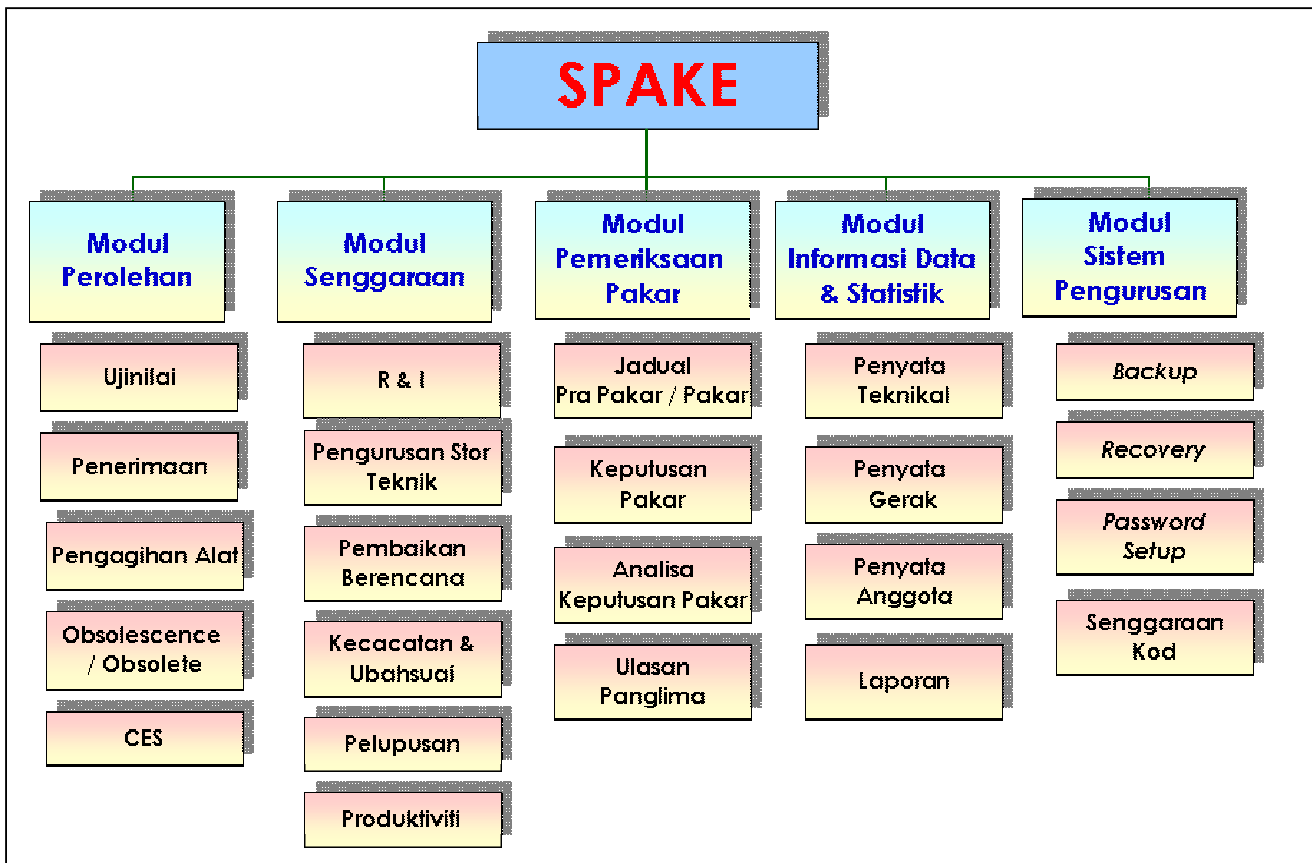


Figure 1.1: SPAKE System Modules

1.1.1 Involvement in SPAKE Project

During the five months industrial attachment with IMATERA Digital Images Sdn. Bhd. (IDIS), the author was required to understand the flow of *Modul Senggaraan*, analyse the user requirements for the system, consult the user on the new system and develop the system. Basically, the client for this system is the Ministry of Defence Malaysia and it would be installed at *Rejimen Semboyan DiRaja (RSD)*.

1.2 Organization Profile

In this part, a brief description of the organization's profile will be discussed. It includes the organization's background, its structure and its experience in software development.

1.2.1 Organization Background

Located at the Jelatek Business Park, Off Jalan Jelatek, Kuala Lumpur, IMATERA Digital Image Services Sdn Bhd (IDIS) is a Bumiputera owned company with many branches throughout Malaysia. IDIS is a combination of two words 'IMAN' and 'SEJAHTERA', with paid up capital of RM 5 millions and an authorized capital of RM 10 millions. The company was established as a member of the Imatera Group of Companies on 1st October 1991.

1.2.2 Nature of Business

Imatera Digital Image Services Sdn Bhd is a growing company involves in Information and Communication Technology (ICT) development and consultancy. IDIS are specializing in the area of:

- i. System Integration for ICT.
- ii. Software Application and Development.
- iii. Data Conversion and Bureau Services.
- iv. Geographic Information System (GIS) / Remote Sensing Development.
- v. Electronic Office (E-Office) and Multimedia Development.
- vi. Customer Relationship Management and Maintenance.
- vii. Security and Safety Division.

1.3 Project Objectives

The main objective of this project is to increase performance, in terms of efficiency, effectiveness, cost and time consumption by implementing the web based application system. Hence, the project also aims to fulfil the following objectives:

- i. To propose a web-based system for the Malaysian Army. The application will improve the Royal Signal Regiment in term of administration management and operation.
- ii. To store all data related with communication equipments including the spare part equipment.
- iii. To reduce time consuming in searching record from Semboyan Department.

- iv. To enable Semboyan Department to perform online data recording and processing through the Internet.
- v. To implement the paperless administration without using the existing manual forms.

1.4 Project Scope

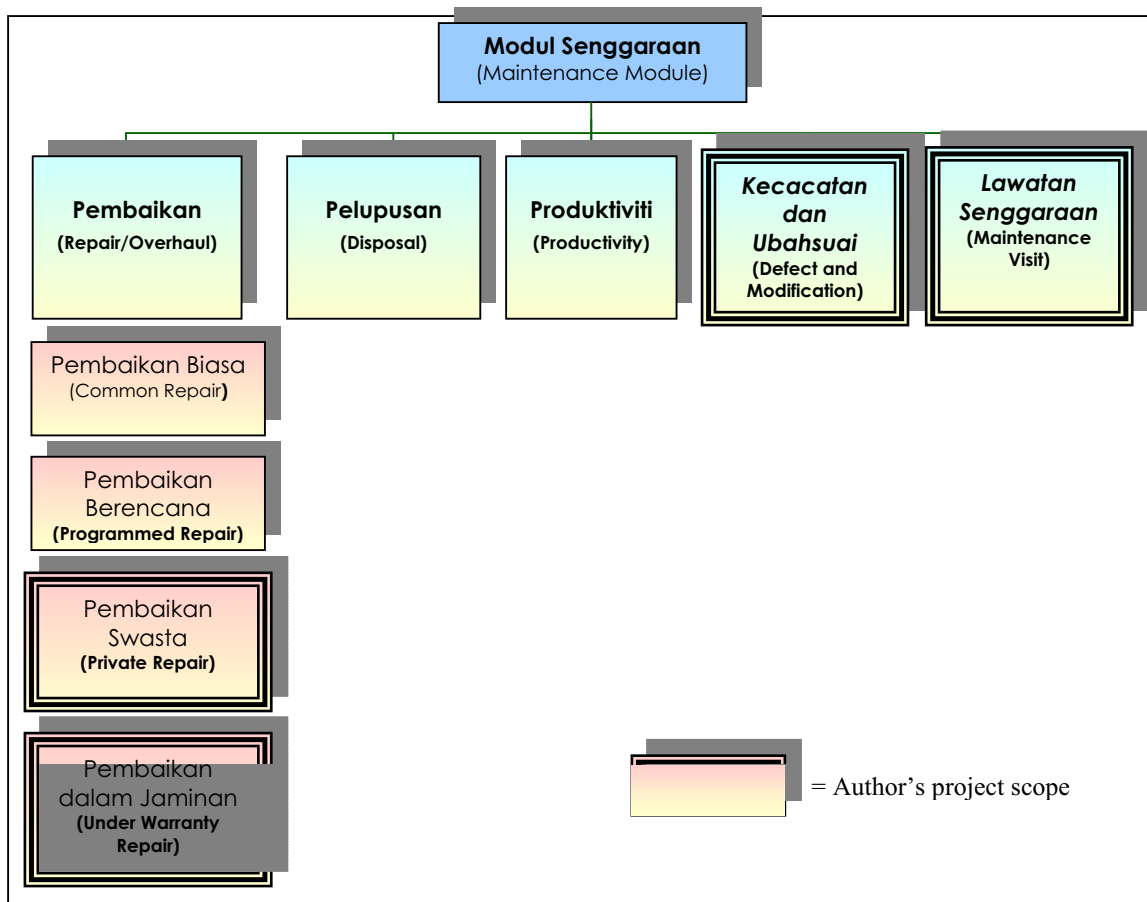


Figure 1.2: Maintenance Sub Modules

In SPAKE system development, the author concentrates in developing the Senggaraan Module. Figure 1.2 shows the sub modules involved in Senggaraan Modules. The scopes that has been pointed in SPAKE system development project are:

- i. Identifying the *Modul Senggaraan* requirements.
- ii. Analyzing and designing and developing the *Modul Senggaraan* which focuses on *Pembaikan Swasta, Pembaikan dalam Jaminan, Kecacatan dan Ubahsuai* and *Lawatan Senggaraan* components.
- iii. Developing the Senggaraan Module components consists of *Pembaikan Swasta, Pembaikan dalam Jaminan, Kecacatan dan Ubahsuai* and *Lawatan Senggaraan* actual system.
- iv. Developing the SPAKE system prototype.
- v. Integrating with overall SPAKE component modules.
- vi. Writing draft of Software Requirement Specification (SRS) documents and Software Test Document (STD) for SPAKE requirement and documentation guidelines by applying using IDIS and DOD-DTD-2167A (Related SPAKE's documentation can be referred to IDIS).

1.5 Project Team Organization

One small team has been setup to develop the SPAKE system. The members of the team consist of permanent staff and practical trainees from several universities. The team has been setup according to the specialty of each member. The SPAKE project team organization is shown in Figure 1.3. The roles for each position in SPAKE project team are illustrated in Appendix A.

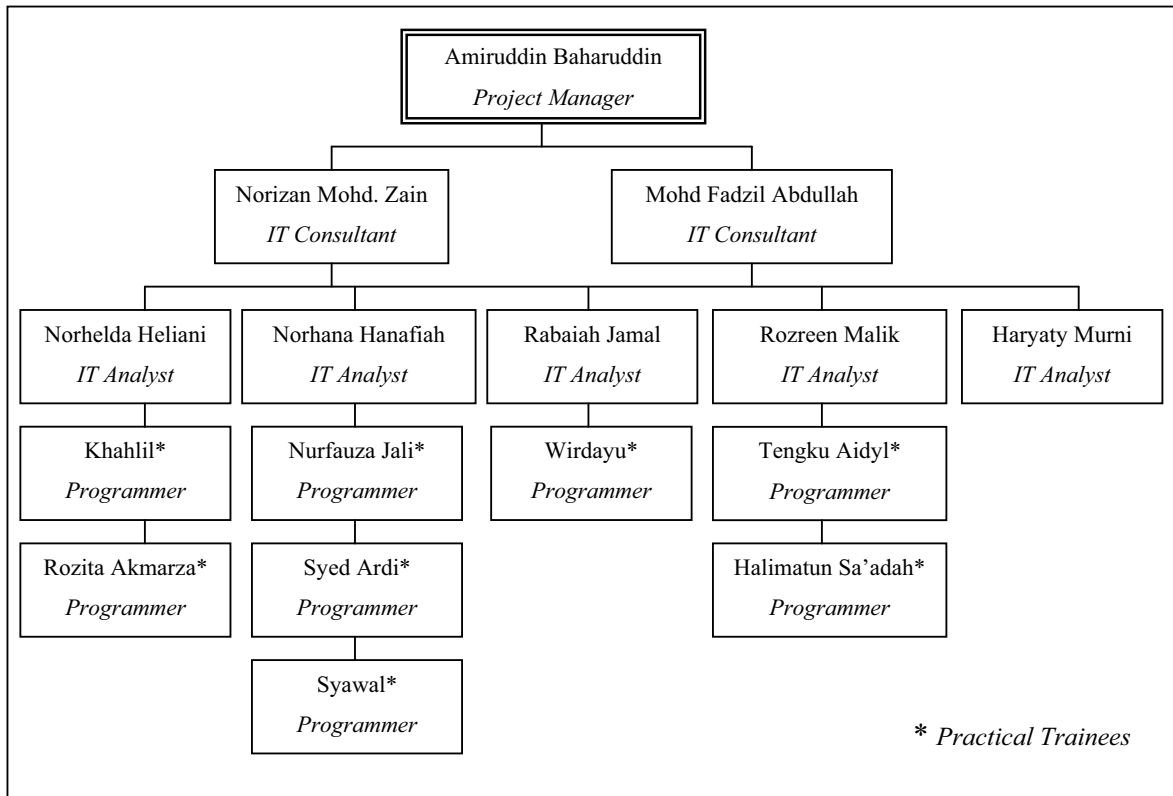


Figure 1.3 : Project Team for SPAKE System Development

1.6 Project Plan

For the project plan, Figure 1.4 shows the task scope and timeframe that has been done by the author during the project duration. The overall milestone of SPAKE Project is shown in Appendix B.

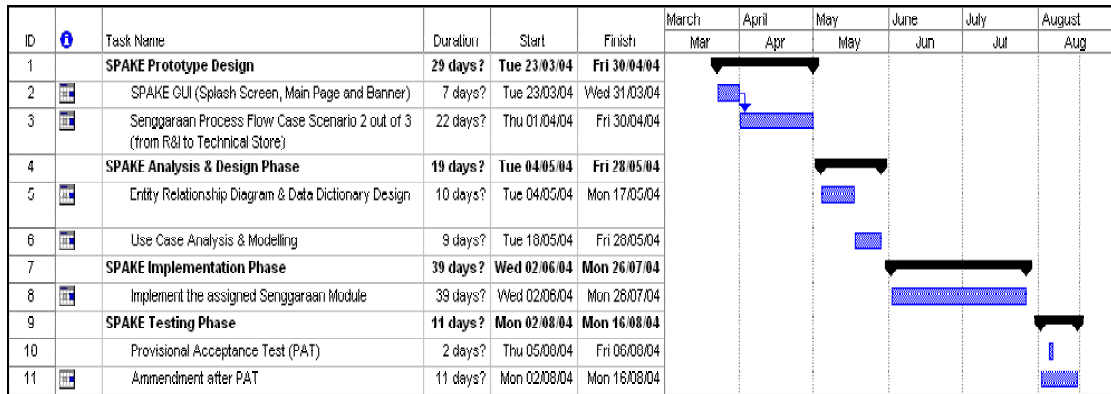


Figure 1.4: Author's SPAKE Project Gantt Chart