RELATIONAL DATABASE DESIGN FOR WEB-BASED COMPUTER INVENTORY SYSTEM JABATAN PELAJARAN NEGERI (JPN) PERAK

A dissertation submitted to the Faculty of Information Technology in partial fulfilment of the requirement for the degree Master of Science (Information Technology) Universiti Utara Malaysia

ABD RASHID BIN HJ SHAFIE

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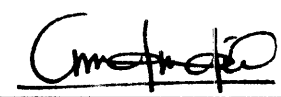
(Signature) : 

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ABSTRAK

Kajian ini ditumpukan kepada proses rekebentuk pangkalan data inventori berasaskan web untuk Jabatan Pelajaran Negeri Perak ringkasnya JPCIS. Kaedah kajian adalah berlandaskan rekabentuk pangkalan data relational. Melalui kaedah ini, lima fasa telah dikenalpasti dan diikuti iaitu (1) Analisis Keperluan, (2) Rekabentuk Pengkalan Data Konseptual, (3) Rekabentuk Pengkalan Data Logikal (4) Rekabentuk Pengkalan Data Fisikal, dan (5) Prototaip. Keperluan terhadap data oleh JPN telah dikenalpasti melalui proses pemerhatian dan dokumentasi. Model Hubungan-Entiti (ER Model) digunakapai untuk mengenalpasti sama ada terdapat perbezaan dalam sesuatu ciri entiti atau persamaan antara satu entiti dengan entiti lain. Terdapat tiga peringkat pengguna dikenalpasti iaitu JPN, PPD dan sekolah. Sebanyak 15 entiti juga dikenalpasti untuk membangunkan pangkalan data ini. Di dalam rekabentuk konsepsual yang dibangunkan, tidak terdapat hubungan antara entity yang berulang. Gambarajah Aliran Data dibina untuk memudahkan proses visualisasi serta untuk menganalisa transaksi. Akhirnya prototaip system inventori berasakan web telah dibina untuk menguji rekabentuk pangkalan data dan menunjukkan ia memenuh keperluan pengguna.

ABSTRACT

This study was focus on designed database system for web-based computer inventory system for Jabatan Pelajaran Perak namely JPCIS. A methodology is defined for the design of this relational database. The methodology is presented as a systematic guide to the five main phases of database design namely as follows (1) Requirement Analysis, (2) Conceptual Database Design, (3) Logical Database Design, (4) Physical Database Design, and (5) Prototyping. The data requirements are defined and conceptualised using an extended Entity-Relationship Model (ER Model), with the extensions being additional semantics such as relationship, optional relationship, and the generalisation abstractions. There are three categories of users and 15 entities been identified. Cross-Referencing Transaction been used to analyse transactions. The main objective is to understand the functionality of transaction (query) run on the database. In Logical Database Design with involved build and validate local logical design, Data Flow Diagram been drawn to visualized it. Data Flow Diagram been used to analyse transactions. The main objective is to understand the functionality of transaction (query) run on the database. Finally automated prototyping been used to validate the database system and the test shown that it meet the users needs.

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DEDICATION

To my wife Nur Natasha Lee,
my son, Nabil Anwar,
my daughters Nur Ashidkin Nabila and Nur Afiqah Nabila,
for their love, patience, and support.

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LIST OF ABBREVIATIONS

ADSL	Asymmetric Digital Subscriber Line
ADB	Analytical Database
CAI	Computer Aided Learning
CASE	Computer-Aided System Engineering
DB	Database
DBALC	Database Application Life Cycle
DBM	Database Modeling
DBMS	Database Management System
DBS	Database System
DBDL	Database Design Language
DMZ	De-Militarised Zone
EMIS	Educational Information Management System
ER	Entity-Relationship
GUI	Graphic User Interface
HDM	Hierarchical Database Model
ICT	Information and Communication Technology
IS	Information System

LIST OF ABBREVIATIONS

ISAM	Indexed Sequential Access Method
IT	Information Technology
JPCIS	JPN Perak Computer Inventory System
JPN	State Education Department (Jabatan Pelajaran Negeri)
LAN	Local Area Network
LCD	Liquid Crystal Display
MOE	Ministry of Education (Kementerian Pelajaran Malaysia)
NDM	Network Database Model
NaLIS	National Infrastructure for Land Information System
ODB	Operational Databases
PPD	District Education Office (Pejabat Pelajaran Daerah)
PIBG	Parent and Teachers Association (Persatuan Ibu Bapa dan Guru)
PHP	Hypertext Pre-Processor
RDM	Relational Database Model
SDLC	System Development Live Cycle
SQL	Structured Query Language
WAN	Wide Area Network
XML	Extensible Markup Language

CHAPTER 1

BACKGROUND OF THE STUDY

1.1 Introduction

An important aspect of most every organisation and enterprise is record keeping. All kinds of data, from emails and contact information to inventory data, are stored in some form of a database. The problem with data is that it changes. Information Technology (IT) management is still an important issue in Ministry of Education (MOE), State Education Department (JPN), District Education Office (PPD) and especially in schools. The main aim of IT management is to supply an accurate, precise, past and reliable source of information. Unfortunately there are still areas where problems arise where by some of the inventory system used today referred is based on a manual filing system. Data collection through out entire schools had been collected using paper form. It still the main part of the organisation mention above to continue their operations till today.

Furthermore, this manual data collection refers to non-standardised format, which will cause difficulty in mining and analyzing existing data to produce information and reports for policy decision makers. A standard collection of data that refers to the same data dictionary using web-based system can reduce the problems mention above.

The contents of the thesis is for internal user only

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