Development and Evaluation of a Decision Model for DBMS Selection to Support Enterprise Information Portal (EIP)

AHMAD FADLI BIN SAAD

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AHMAD FADLI BIN SAAD

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ABSTRACT

The past decade has seen an extraordinary increase in the availability and use of DBMS in organizations. Today, DBMS also plays an important role to support Enterprise Information Portal (EIP) applications. However, a task for evaluation and selection from several candidates of DBMS tend to be very complex and difficult since both qualitative and quantitative issues need to be considered. Furthermore, the selection of DBMS must be based on expert perception of the organization. Wrong choice or improper selection of DBMS will negatively affect the implementation of EIP in the organization. This thesis presents the combination of Delphi technique and the Analytical Hierarchy Process (AHP), for selecting appropriate DBMS to support EIP application. The Delphi method has been applied to determine the selection criteria and sub criteria of DBMS for EIP from experts' perceptions. The AHP is proposed to develop and to evaluate the decision model of DBMS selection. It is seen as an effective approach in dealing with DBMS selection decision problems. This method adopts a multi-criteria approach that can be used for analysis and comparison of several aspects within DBMS. Two DBMS products namely ORACLE and SYBASE are examined for the study. The results of this research will be useful to organizations because it provides information and guideline regarding the importance of criteria and the sub-criteria and thus may help organizations to choose appropriate DBMS to match their needs.

ABSTRAK

Dekad terdahulu telah memperlihatkan suatu peningkatan yang luar biasa dalam ketersediaan dan kegunaan Sistem Pengurusan Pangkalan Data (SPPD) dalam organisasi. Pada hari ini SPPD juga memainkan peranan yang penting untuk menyokong aplikasi Portal Maklumat Perniagaan (PMP). Walaubagaimanapun tugas penilaian dan pemilihan calon-calon SPPD adalah kompleks dan sukar memandangkan isu-isu kualitatif dan kuantitatif perlu dipertimbangkan. Selain itu, pemilihan SPPD juga perlulah berdasarkan kepada pandangan pakar dalam sesebuah organisasi. Pemilihan SPPD yang salah atau tidak sesuai akan mengakibatkan kesan yang negatif dalam pelaksanaan aplikasi PMP. Tesis ini mempersembahkan gabungan kaedah Delphi dan AHP untuk memilih SPPD yang sesuai bagi menyokong PMP. Kaedah Delphi digunakan bagi menentukan kriteria dan sub kriteria SPPD bagi menyokong PMP mengikut tanggapan pakar. Kaedah AHP pula digunakan bagi membangun dan menilai model keputusan bagi pemilihan SPPD. Pendekatan ini efektif dalam menangani keputusan bagi pemilihan SPPD. Kaedah ini juga menerima pendekatan multi kriteria yang boleh digunakan untuk menganalisis dan membuat perbandingan beberapa aspek SPPD. Dua produk SPPD iaitu Oracle dan Sybase dikaji dalam penyelidikan ini. Keputusan bagi penyelidikan ini amat berguna kepada organisasi kerana ia menyediakan maklumat dan panduan berhubung kepentingan kriteria dan sub kriteria. Oleh demikian, ini membantu organisasi memilih SPPD yang sesuai bagi memenuhi keperluan mereka.

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LIST OF ABREVIATIONS

AD – Application Development

AHP – Analytical Hierarchy Process

AU – Additional Users

AI – Artificial Intelligent

API – Applications Programming Interface

BI – Business Intelligence

CAT – Categorization

CBSB – COTS-based Software Development

CDM – Content And Document Management

CE – Comprehensive Evaluation

CFD – Composite Features Diagramming

CUS – Customization

CI – Consistency Index

CISD – COTS-based Integrated System Development

COTS – Commercial off-the- Shelf

CR – Consistency Ratio

DC – Database Community

DBMS – Database Management System

DDL – Data Description Language

DESMET – Determining Methodology for Software Methods Tools

DML – Data Manipulation Language

DSS – Decision Support System

EIPs – Enterprise Information Portals

ERP – Enterprise Resource Planning

FEA – Feature Analysis

FRS – Functional Requirements Specification

HTML – Hypertext Markup Language

INT – Integration

IS	– Information System
IT	– Information Technology
LSM	– Large scale machine
LB	– Load Balancing
MCDM	– Multi Criteria Decision Making
MIS	– Management Information System
OA	– Office Automation
OMSs	– Object Management Systems
OLAP	– On-line Analytical Processing
OTSO	– Off-The-Shelf Option
PMP	– Portal Maklumat Perniagaan
PT	– Performance and tuning
RDBMS	– Relational Database Management Systems
REP	– Replication
RFP	– Request for Proposal
SCL	– Scalability
SE	– Search Engine
SEC	– Security
SEEs	– Software Engineering Environments
SPPD	– Sistem Pengurusan Pangkalan Data
SQL	– Structured Query Language
STACE	– Social-Technical Approach to COTS Evaluation
MD	– Mobile Devices
MT	– Metadata
MIS	– Management Information System
KM	– Knowledge Management
XML	– External Markup Language

CHAPTER ONE

INTRODUCTION

The past decades have witnessed enormous growth in the number of Database Management Systems (DBMSs) products to support organization functions. One of the critical tasks that top management and IT managers must handle is to make decision in choosing DBMS to support Enterprise Information Portal (EIP). This chapter gives an overview on the background of this research. The problem statements, objectives, project scope and the organization of the thesis are discussed.

1.1 BACKGROUND

The concept of the evaluation and selection of software products tend to be very important and within the scope of enterprise decision making. With the growth of inter-organizational projects the evaluation task takes on a broader and more complex characteristic (Sarkis & Talluri, 2003). Some authors have identified several methods for selecting software products. Maiden (1998) proposed PORE (Procurement-Oriented Requirements Engineering), a methods that guides the software selection process through

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