EXAMINING QUALITY FACTORS INFLUENCING THE SUCCESS OF DATA WAREHOUSE

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Abstrak

Kebergantungan organisasi kepada sistem gudang data (Data Warehouse) yang semakin meningkat masakini menyebabkan pihak pengurusan memberikan perhatian khusus kepada peningkatan kejayaan sistem tersebut. Walau bagaimanapun, kadar kejayaan implementasi gudang data adalah rendah dan kebanyakan organisasi tidak mencapai objektif yang disasarkan. Kajian terbaru menunjukkan bahawa penambahbaikan dan penilaian terhadap kejayaan gudang data merupakan salah satu perkara yang dititikberatkan oleh eksekutif IT.Disamping itu, kajian yang menyentuh isu-isu faktor kejayaan implementasi gudang data adalah kurang.Tambahan pula, adalah penting bagi sesebuah organisasi untuk mempelajari kualiti yang perlu diterapkan sebelum gudang data sebenar dibangunkan.Adalah penting untuk mengenalpasti aspek-aspek kejayaan sistem gudang data yang kritikal kepada organisasi bagi membantu eksekutif IT membuat strategi penambahbaikan gudang data yang berkesan.Oleh itu, kajian ini bertujuan untuk memahami dengan lebih mendalam faktor-faktor kritikal dalam penilaian kejayaan sistem gudang data.Kajian ini membangunkan satu model komprehensif untuk sistem gudang data yang berjaya dengan mengaplikasikan DeLone and McLean IS Success Model.Penyelidik memodelkan hubungan di antara faktor kualiti dan kebaikan gudang data.Kajian ini menggunakan kaedah kuantitatif untuk menguji hipotesis kajian.Kutipan data dibuat menggunakan kajiselidik berasakan web.Sampel kajian melibatkan 244 ahli kepada The Data Warehouse Institution (TDWI) yang bertugas di dalam pelbagai industri di seluruh dunia.Borang soal selidik mengandungi 6 pembolehubah tidak bersandar dan satu pembolehubah bersandar.Pembolehubah tidak bersandar digunakan untuk menilai kualiti sistem, kualti maklumat, kualiti perkhidmatan, kualiti hubungan, kualiti pengguna dan kualiti perniagaan.Manakala pembolehubah bersandar pula digunakan untuk menilai kebaikan sistem gudang data.Analisis kajian menggunakan kaedah analisis deskriptif, analisis faktor, analisis korelasi dan analisis regresi yang menyokong semua hipotesis.Hasil kajian menunjukkan bahawa terdapat hubungan kausal yang positif di antara setiap faktor dengan kebaikan sistem gudang data.Ia juga menunjukkan bahawa kebaikan sistem gudang data akan bertambah sekiranya keseluruhan kualiti bertambah.

Katakunci: gudang data, kejayaan gudang data, faedah gudang data, kualiti maklumat, kualiti hubungan, kualiti pengguna, business intelligence, pembuatan keputusan.

Abstract

Increased organizational dependence on data warehouse (DW) systems has drived the management attention towards improving data warehouse systems to a success. However, the successful implementation rate of the data warehouse systems is low and many firms do not achieve intended goals. A recent study shows that improves and evaluates data warehouse success is one of the top concerns facing IT/DW executives. Nevertheless, there is a lack of research that addresses the issue of the data warehouse systems success. In addition, it is important for organizations to learn about quality needs to be emphasized before the actual data warehouse is built. It is also important to determine what aspects of data warehouse systems success are critical to organizations to help IT/DW executives to devise effective data warehouse success improvement strategies. Therefore, the purpose of this study is to further the understanding of the factors which are critical to evaluate the success of data warehouse systems. The study attempted to develop a comprehensive model for the success of data warehouse systems by adapting the updated DeLone and McLean IS Success Model. Researcher models the relationship between the quality factors on the one side and the net benefits of data warehouse on the other side. This study used quantitative method to test the research hypotheses by survey data. The data were collected by using a web-based survey. The sample consisted of 244 members of The Data Warehouse Institution (TDWI) working in variety industries around the world. The questionnaire measured six independent variables and one dependent variable. The independent variables were meant to measure system quality, information quality, service quality, relationship quality, user quality, and business quality. The dependent variable was meant to measure the net benefits of data warehouse systems. Analysis using descriptive analysis, factor analysis, correlation analysis and regression analysis resulted in the support of all hypotheses. The research results indicated that there are statistically positive causal relationship between each quality factors and the net benefits of the data warehouse systems. These results imply that the net benefits of the data warehouse systems increases when the overall qualities were increased. Yet, little thought seems to have been given to what the data warehouse success is, what is necessary to achieve the success of data warehouse, and what benefits can be realistically expected. Therefore, it appears nearly certain and plausible that the way data warehouse systems success is implemented in the future could be changed.

Keywords: data warehouse, data warehouse success, data warehouse net benefits, information quality, relationship quality, user quality, business intelligence, decisions making.

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Lastly, I dedicate this thesis to the spirit of my brother Mohammed, who was martyred during the war on Gaza, the end of 2008, and to the spirit of my uncle Mahmoud Al-Mabhouh who was killed by the Israeli Mossad in Dubai, the beginning of 2010.

Table of Contents

List of Tables

List of Figures

List of Appendices

List of Abbreviations

DW	**Data Warehouse**
IS	Information System
MIS	Management Information System
IT	Information Technology
PCs	Personal Computers
CSFs	Critical Success Factors
TDWI	The Data Warehouse Institution
DSS	Decision Support System
KM	Knowledge Management
OLAP	Online Analytical Processing
OLTP	Online Transaction Processing
ETL	Extract, Transform and Load
MDD	Multi-Dimensional Database
RDBMS	Relational Database Management System
B2C	Business-to-consumer
B2B	Business-to-business
CRM	Customer relationship management
ERP	Enterprise Resource Planning
VCF	Virtual Case File
FSC	Financial Service Company
GUI	Graphical User Interfaces
IV	Independent Variable
MV	Mediator Variable

DV	Dependent Variable
EFA	Exploratory Factor Analysis
CFA	Confirmatory Factor Analysis
PCA	Principal Components Analysis
KMO	Kaiser-Meyer-Olkin
MAS	Measure of Sampling Adequacy
SPSS	Statistical Package for the Social Sciences

CHAPTER One

INTRODUCTION

In this chapter, the researcher discusses the background of the data warehouse's technologies. Then starts with the statement of the problem, the research questions, the research objectives, the significance of the study, the scope of the study, and finally the structure of the study.

1.1 Introduction

A data warehouse is an Information System (IS) that provides the means to extract the knowledge from the operational data stores of the business. Data warehouse can also provide information about suppliers, customers, markets, and financial results. Thus, according to Ganczarski (2006), it is enabling the organizations to adapt to the present, learn strategically from the past, and position for the future. Furthermore, a data warehouse is a collection of data from multiple sources, integrated into a common repository and extended by summarized information for the purpose of analysis (Ester *et al*., 1998). This repository allows enterprises to collect, organize, interpret and leverage the information for decision support (Groth, 2000; Wixom & Watson, 2001; Gupta & Mumick, 2005). It provides the foundation for effective business intelligence solutions for the companies seeking competitive advantage (Chenoweth, Corral, & Demirkan, 2006). Popularity of the data warehouse for data analysis has grown tremendously, as the conventional transaction processing systems have matured while becoming faster and stable (Raden, 1996; Humphries, Hawkins, & Dy, 1999; Phipps & Davis, 2002; Parida, 2005).

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