The Influence of Service Quality and Relationship Quality on the Implementation of Data Warehouse Systems Success by Using Information System Success Model

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Abstract: *Data warehouse (DW) refers to a system architecture rather than a software product or application, and it is used to improve Information Technology (IT) infrastructure. However, the rate of its successful implementation is still low and most firms report failure to leverage the system for their goals. This paper provided a discussion of the results of the model based on Information System (IS) Success Model, particularly the relationship between quality factors and the net benefits obtained from the data warehouse system. Independent variables were selected to gauge service quality and relationship quality service, while the dependent variable measured the net benefits obtained from the system. The paper provided a background on data warehouse and successful implementation of data warehouse, as well as a description of the research model and proposed hypotheses inclusive of the affective factors. It provided a deep insight into the data warehouse success factors with the use of data*

warehouse success model that ultimately provided informed inferences for decision making regarding successful data warehousing implementation.

Keywords: Data warehouse, Information System success model, service quality and relationship quality.

Introduction

A data warehouse refers to an information system (IS) that enables the extraction of knowledge from operational business data stores. It also provides information concerning suppliers, customers, markets and financial outcomes. In turn, it enables the adaption of the organizations to the current environment while learning from its past and readying for its 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. This repository allows enterprises to collect, organize, interpret and leverage the information for decision support. It provides the foundation for effective business intelligence solutions for the companies seeking competitive advantage. Data warehouse was introduced in the earlier parts of the 1990s to support technology data integration from several sources [1]. In the current times majority of organizations use Information Technology (IT) infrastructures to facilitate data management, integration and access. This underlies the reason why organizations should adopt IT infrastructures that provide suitable data and tools capable of supporting the achievement of informed decisions making [2].

In sum, organizations highly concern about the quality of data warehouse due to inadequate efforts made to improve the success of data warehouse in their organizations. Based on the issues discussed above, it found that there is insufficient attention given to data warehouse success and that refers to a set of issues and factors related to the data warehouse success. In addition, few studies have tried to investigate the most significantly influencing

characteristics among quality factors and net benefits in the context of data warehouse success.

The scope of this study is to develop and validate a model for the success of data warehouse systems and determine the service quality and relationship quality to evaluate successful data warehouse systems and to provide an extensive investigation between the two. The study also aims to examine the effects of service quality and relationship quality.

Quality Factors of Data Warehouse

According to [3] defined the organizational quality in light of quality as excellence, quality as specifications conformity, quality as value and quality as satisfying customers' expectations. Excellent data warehouse quality entails the use of advanced technology, adherence to the standards of industry software, establishment of robust control procedures and relaying performance that is free of error. The data warehouse value can be established by enhancing profit margins of the organization, facilitating useful and applications with ease of use, creating management tools, and reinforcing decision-making procedures [4].

Service Quality

Service quality is the level of inconsistency between the service recipient's expectation of service and his perceptions of the actual service received [5]. Service quality is a concept that has garnered the attention of studies in the IS field, particularly in the role of IS unit in an organization with the current personal computing launched in the last decade. The IS services notion was still ambiguous when IS departments were considered as system developers and operators. Users were offered the least services that involved maintenance like fixing bugs, and analyzing use statistics in the last phase of the traditional system development cycle. As a service, provider, the IS departments became increasingly important following the introduction of personal computers that allows greater user-interaction [6]. The proper measurement of service quality

should be a part of IS success components [7]. Added to this, [8] conducted an empirical study and revealed specific significance of service quality in guaranteeing successful data warehouse system use.

Studies in literature [9] highlighted a core dimension of service quality in the case of the narrowly defined online businesses like online banks, website and portal services. Specifically, [10] gauged the perceptions of consumers of online service quality with the help of six dimensions namely, reliability, responsiveness, competence, ease of use, product portfolio and security.

The study questionnaire had three pages containing items serving as raw data for analysis through the use of Statistical Package for the Social Sciences (SPSS), version 17. Specifically, the survey questionnaire was divided into some sections, with the first section dedicated to obtaining the personal details of the respondents (i.e., location, position of organization, experience in data warehouse projects, status of data warehouse projects and organizational details). Section 2 and 3 were dedicated to the data warehouse systems, with the former containing items to the statements related to service quality of data warehouse system, and the latter containing items regarding the relationship between quality of data warehouse systems. In the final section, the items contained within are about the net benefits of data warehouse systems.

Simple random sampling entails the least bias and it offers generalizability, where every element with similar and equal chance to be selected as a part of the population subject. Therefore, the researcher chose 2,500 members of ICT firms in Iraq randomly from a total of 3900 members. The selection was based on the ICT frequency of log-in, events participation and published articles and papers. The questionnaires were emailed to 500 members, from which 388 questionnaires were retrieved (78% response rate). Thirty-two questionnaires from the 388 retrieved ones were dropped because of incompleteness. The construct of service

quality address the support of users by the IS department and it is frequently measured through reliability, responsiveness, assurance and empathy of the organization. In turn, it influences the net benefits obtained from the data warehouse systems. The construct is measured through the above mentioned variables in the present study. The relevant measurement items along with their references for the measurement of this construct in the questionnaire are displayed in Table 1.

Table 1: Service Quality Measurements

Characteristic Measured	Questions
Reliability	When DW system promises to do something, it does so.
Responsiveness	DW system is always willing to help me.
Assurance	DW team has the knowledge to do their job well.
Empathy	DW team understands the specific needs of its users.
Customization	DW system provides customization for the services it provides.
User Training	Our organization provides extensive training on how to understand, access, or use DW system.

Table 2: Relationship Quality Measurements

Characteristic Measured	Questions
Communication	DW parties effectively communicate well with each other.
Coordination	DW parties are highly coordinate resources and activities well with each other.
Cooperation	DW parties cooperate well and willing to help out each other.
Conflict	The process of resolving conflicts between DW parties is effective.
Trust	DW parties should be trusted to behave fairly.
Commitment	DW parties are willing to commit resources to sustain the relationship.

The relationship quality construct is described as the complete assessment of the relationship strength between the parties to the data warehouse. The measurement of this construct is conducted through the use of the following factors; communication, coordination, cooperation, trust, conflict and commitment between the parties to the data warehouse. As mentioned, these may influence the advantages obtained from the data warehouse systems. The above six factors are utilized for the measurement of the construct and Table 2 contains the variable, measurements and the references that were included in the questionnaire.

Table 3: Net Benefits Measurements

Characteristic Measured	Questions
Better decisions	DW improves decision making capabilities.
Time savings	DW reduces the time it takes to support decision.
Effort savings	DW reduces the effort it takes to support decision.
Improvement of business processes	DW improves my organization business processes.
Improvement of planning processes	DW improves my organization planning processes.
Improvement of operational control processes	DW improves my organization operational control processes.

The construct of net benefits is described as the level to which data warehouse system contributes to the success of the gained by the group, organization, industry, society and the like. This is frequently measured in literature in light of enhanced decision-making, enhanced productivity, enhanced profits, enhanced sales, market efficiency, organizational performance and development of the economy. In the present study, the net benefit variable is measured through operational benefits, excluding financial performance values. The items developed in the questionnaire for the construct measurement are presented in Table

3. In Table 4, the demographic and background information of the study sample are presented.

Table 4: Demographics Information

1.	Where are you located?			
	USA	Canada	Europe	Australia
	Asia	Africa	Central or South America	Middle East
2.	What is the current status of your DW project?			
	Live	Planned	In development	Don't know
3.	Which best describes your current position?			
	DW Business Analyst	DW Manager	DW DBA	IT Specialist/Staff
	DW User	DW Specialist	IT Manager	Others
4.	How long have you been in your current position?			
	Less than 1 year	1 to 3 years	3 to 6 years	More than 6 years
5.	How long have you worked for this organization?			
	Less than 2 years	2 to 5 years	5 to 10 years	More than 10 years
6.	How long has DW in your organization been in existence?			
	Less than 2 years	2 to 5 years	5 to 10 years	More than 10 years
7.	Which best describes your organization's primary industry?			
	Aerospace	Advertising / Marketing / PR	Agriculture	Computer Manufacturing
	Chemical/petroleum	Construction/architecture/engineering	Consulting / professional services	Education
	Financial services	Food/beverage	Government: Federal	Healthcare
	Insurance	Manufacturing (non-computers)	Media	Software/ Internet
	Telecommunications	Transportation / Logistics	Utilities	Others

Relationship Quality

Regardless of the several researchers that offered a discussion of the concept of relationship quality in different contexts [12] and [13], its definition still varies from one research project to the next. The authors were of the consensus that the relationship quality is a higher-order construct that is composed of specific related elements. In fact, extant literature indicates that trust, commitment, communication, culture and user participation positively affect relationship quality [12] and [13]. Different factors/dimensions have been employed to examine relationship quality-IS relationship.

To begin with, [13] defined relationship quality as the complete appraisal of the relationship strength and the level to which it satisfies the parties' expectations and needs of successful/unsuccessful interactions. The study made use of trust, commitment and satisfaction to gauge relationship quality for CRM performance. Meanwhile, in [12] study, relationship quality was considered as a major factor that plays a conduit between IS factors and business profitability factors (e.g., commitment and retention). According to [13], quality of relationship connects IS users to IS departments and spells the success/failure of the IS project.

Information Systems Success Models

Following an analysis of more than 100 of their model studies, [7] brought forward an updated model (see Figure 1) with the addition of a new dimension namely, service quality. They indicated the evolution of information technology and the environment, from which new challenges stemmed from and stressed on the need to adjust the original models to perform accurate measurements.

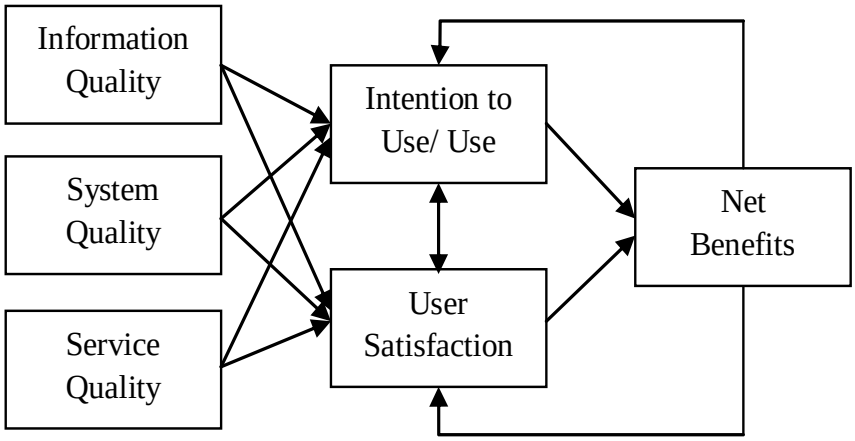

Figure 1: Updated IS Success Model [7]

With the further evolution of the impacts of information system, surpassing the immediate user, researchers suggest to add IS impact measures like working impacts inter-organizational and industry impacts [14], consumer impacts [15], and societal impacts [16]. On this basis, DeLone and McLean replaced individual impacts with organizational impacts in their 1992 IS success model and added a new benefits measure. Such measure depends on the system evaluated. They also decided to categorize the impact measures into one impact or benefit category known as net benefits.

Aside from [7], other authors also tried their hand at creating alternative IS success models – for instance, [5] proposed six categories of effectiveness on the basis of unit analysis and evaluation type dimensions; they're infusion measures, market measures, economic measures usage measures, perceptual measures and productivity measures. Added to this, [16] proposed a framework that included three measure zones, which are efficiency, effectiveness and understanding. The models were examined in the organizational context. Despite these alternative models the [7] model has been more accepted in literature as a result of which, it has become the standard for specification and justification of the measurement of dependent variable in IS studies.

The expansive use and citation of the DeLone and McLean model was evidenced by a research in the fall of 1999, wherein the model yielded 44 referred journal articles and 15 papers from the International Conference on Information System (ICIS) that cited the IS success model from 1993-1999. The model measures IS success in light of current dimensions and it has more capable of evaluating IS success. In [17] study, they adapted and updated the IS success model of DeLone and McLean to Knowledge Management (KM) success and reached to the conclusion that it is a successful model in predicting KM success and developing effective KM. In a related study, [18] conducted a review of 180 papers in the academic literature dedicated to some aspect of IS success with the use of qualitative literature review method. The study described measures to gauge six success constructs and it conducted an analysis of the relationship between 15 relationships among them in organizational as well as individual cases. Their findings revealed that majority of researches concentrated on a single dimension of success like information quality, net benefits or user satisfaction, with only a few measuring many dimensions of success at a time and the interconnections among them.

Research Model Based on IS Success Model and Hypotheses

This study adopted the updated [7]. Studies in literature have examined the success of information systems in many different ways [19] through the measurement of service quality and relationship quality (independent variables) and net benefit (dependent variable) of distinct applications. Researchers view IS success as a construct with multiple aspects and they choose suitable success measures on the basis of their objectives and focus of study [20] and [13]. This offers several potential relationships to be conceived among the success dimensions during research model development. The model lays down a framework for metrics that can be utilized for data warehouse implementation management to guarantee its successful use. [7] IS success model dominates the choice of dependent variables by the researchers.

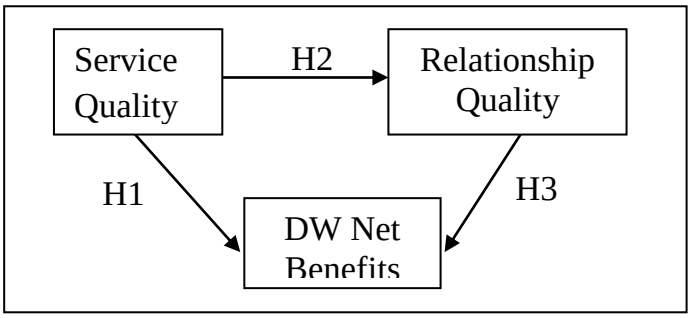

Figure 2: Research Model and Hypotheses

According to the objective of the present study, the researcher determined the suitable variables and measures for data warehouse success. The study's model comprises of three constructs (see Figure 2), and it proposes service quality and relationship quality as the independent variables, while the net benefit as the dependent variable. The following hypotheses are developed to be tested;

H1: Service quality is positively associated with data warehouse net benefits.
H2: Service quality is positively associated with relationship quality.
H3: Relationship quality is positively associated with data warehouse net benefits.

Data Analysis and Results

The first step of analysis contains descriptive analysis of respondents. Exploratory factor analysis performs in the second step. Step three investigates the reliability and validity of the items. Step four explains the use of multivariate analysis to test the stated hypotheses. The factor analysis decreases the number of variables to a meaningful, interpretable and manageable set of factors. Indeed, factor analysis is considered as important statistics technique in data analysis. This type of analysis was usually conducted in order to understand the dimensionality of the variables

in the proposed framework or to realize the relationship in empirical research.

Analysis of Sample Characteristics

From the analysis of demographic characteristics, it is evident that majority of the respondents (82 respondents), accounting for 33.6%, followed by the second largest majority (66 respondents), accounting for 27.0% from Canada, then Europe (34 respondents) accounting for 13.9%, Australia (30 respondents) accounting for 12.3%, Asia (14 respondents) (5.7%), Middle East (8 respondents), accounting for 3.3% and lastly, Africa and Central/South America (5 respondents each) accounting for 2% of the total sample. This indicates the robustness of the outcome, with the respondents, from which data concerning data warehouse implementation was obtained, hailing from different developed countries.

With regards to job specification, the respondents worked in different job positions. From the 244 respondents, the first two majority groups (16.8% each) were DW specialists, and IT specialist/staff, followed by IT managers (15.2%), DW business analysts (12.7%), DW user (11.5%) and DW, DBA (11.5%). In the last two minority groups were DW managers (10.2%) and IT/DW related positions (5.3%).

As for the respondents' position tenure, majority of the respondents had occupied their position for over 3 years (51%), followed by those with 3 years of experience (27%), and lastly, less than a year experience (21%). This shows that majority of respondents were experienced enough to provide their opinion and reply to the items in the questionnaire. Moving on to data warehouse project status, majority of the respondents (51.2%) had experienced one DW application live, and approximately 30.3% experienced it in the development stage, 17.2% were in the planning stage, and 1.2% were not making any effort towards data warehouse implementation. This indicated that over 80% of the respondents had managed to implement data warehouse

applications, and had the ability to assess data warehouse applications success/failure.

With regards to the scope of data warehouse implementation, majority of the respondents (50.4%) reported enterprise-wide implementation, 24.6% reported department/location-wise implementation, 23.0% piloted implementation in a single department/location, and 2.0% were not aware of the scope of data warehouse within their organizations. As for the industry of the organizations, the respondents hailed from various industries, with majority of them (13.9%) from the financial services sector, followed by healthcare sector (9.0%), government/federal sectors (8.6%), consulting/professional services sector (7.0%), education sector (6.1%), and other industries (55.3%). This result reveals that the respondents came from different industries and this contributes to the findings generalization from the questionnaire of the research as shows below in table 5.

Table 5: The Questionnaire of the Research

No		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	When DW system promises to do something, it does so.	1	2	3	4	5
2.	DW system is always willing to help me.	1	2	3	4	5
3.	DW team has the knowledge to do their job well.	1	2	3	4	5
4.	DW team understands the specific needs of its users.	1	2	3	4	5
5.	DW system provides customization for the services it provides.	1	2	3	4	5
6.	Our organization provides extensive training on how to understand, access, or use DW system.	1	2	3	4	5

No		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
7.	DW parties effectively communicate well with each other.	1	2	3	4	5
8.	DW parties are highly coordinate resources and activities well with each other.	1	2	3	4	5
9.	DW parties cooperate well and willing to help out each other.	1	2	3	4	5
10.	The process of resolving conflicts between DW parties is effective.	1	2	3	4	5
11.	DW parties should be trusted to behave fairly.	1	2	3	4	5
12.	DW parties are willing to commit resources to sustain the relationship.	1	2	3	4	5
13.	DW improves decision making capabilities.	1	2	3	4	5
	DW reduces the time it takes to support decision.	1	2	3	4	5
14.	DW reduces the effort it takes to support decision.	1	2	3	4	5
15.	DW improves my organization business processes.	1	2	3	4	5
16.	DW improves my organization planning processes.	1	2	3	4	5

17.	DW improves my organization operational control processes.	1	2	3	4	5

Normality Assessment

In regression analysis, the primary concerns are outliers and linearity as highlighted by [21]. Therefore, the two major tests that are usually carried out for univariate normality (the distribution shape) are kurtosis and skewness used with interval and ratio scale data. The kurtosis and skewness values are zero if there is normal distribution although normal distribution is not a pre-requisite for factor analysis. Majority of multivariate statistical methods measuring central tendency and variability are also useful in determining normal distribution [21]. In the present study, normality analysis was employed with the use of probability plots (P-P plots) as presented in Figure 3. Data was examined on the basis of the mentioned guidelines above and were deemed acceptable.

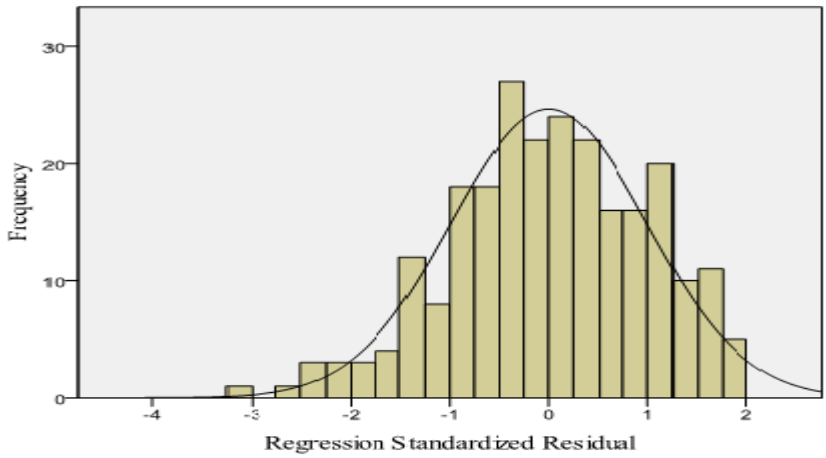

Figure 3: Normal probability plots (P-P plots)

Reliability Analysis and Descriptive Statistics

The original number of items and the final number of items following factor analysis are presented in Table 6. The table also contains the reliability values obtained from obtaining Cronbach's alpha and descriptive statistics of the items in table's number 1, 2 and 3.

Table 6: Reliability Alpha and descriptive statistics for constructs

Constructs	Original No. of Items	Final No. of Items	Cronbach Alpha	Mean	Standard Deviation
Service Quality	6	6	.916	5.712	1.562
Relationship Quality	6	6	.985	5.519	1.538
Net Benefits	6	6	.881	5.327	1.723

The data provided in Table 6 was obtained by analyzing reliability analysis through Cronbach's alpha that has its basis on the average correlation of items, within a test – it confirms the standardization of items or the lack thereof. The lack of standardization entails the calculation of the average covariance among the items. Cronbach's alpha is considered as correlation coefficient ranging from 0 to 1, with new measures necessitating reliabilities of at least 0.60. Generally, a reasonable Cronbach's alpha value is over 0.80, an acceptable value is 0.70 or higher, a neutral (neither good nor bad) value is 0.60, a miserable value is 0.50 or above, and an unacceptable one is below 0.50 [21]. The values of Cronbach's alpha in Table 5 range from 0.791 to 0.919, indicating acceptable reliability.

On the basis of the above table, the net benefits construct obtained the highest mean, with service quality and relationship

quality following respectively. From the table, it is evident that the net benefits construct also obtained the highest standard deviation, after which service quality and relationship quality followed respectively.

Correlations and Regression Analysis

The first hypothesis proposed the positive relationship between service quality and net benefits in the context of data warehouse system. Table 7 indicates the results of the analysis, from which the values indicate support for H1 at the 0.000 level of significance, and the correlation coefficient of 0.686.

Table 7: Hypothesis (H1) Correlations

		Net Benefits
Service Quality	Pearson Correlation	0.686**
	Sig. (2-tailed)	0.000
** Correlation is significant at the 0.01 level (2-tailed).		

In the second hypothesis proposed the positive relationship between service quality and relationship quality in data warehouse success. Table 8 contains the data analysis results and the obtained values supported H2 at the level of significance of 0.000 and a standard correlation coefficient of 0.617. In particular, the results supported the significant relationship between service quality and relationship quality in data warehouse context in light of improved communication, coordination, and cooperation, creating commitment, increasing trust and reducing conflicts.

Table 8: Hypothesis (H2) Correlations

		Information Quality
Service Quality	Pearson Correlation	0.671**
	Sig. (2-tailed)	0.000
** Correlation is significant at the 0.01 level (2-tailed).		

Finally, the third hypothesis proposed a positive relationship between relationship quality and net benefits of the data warehouse system. The analysis results showed the correlation coefficient to be 0.679 and the other values in Table 9 evidenced a significant positive relationship between the two variables, supporting H3 at 0.000 significance level. This result indicates that providing good quality of relationship quality with data warehouse parties would promote successful data warehouse system. Relationship, in this case, encapsulates communication, coordination, cooperation, commitment, and trust with data warehouse parties.

Table 9: Hypothesis (H3) Correlations

		Net Benefits
Relationship Quality	Pearson Correlation	0. 0.679**
	Sig. (2-tailed)	0.000
** Correlation is significant at the 0.01 level (2-tailed).		

Table 10: Multiple Regression Results of Service Quality and Relationship Quality with DW Net Benefits

Variables	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	1.420	0.362		6.563	0.000
Service Quality	0.581	0.075	0.669	11.863	0.000
Relationship Quality	0.765	0.064	0.847	10.754	0.000
Dependent Variable: DW Net Benefits, R=0.784 [a], R2=0.614, Std. Error of the Estimate = 0.85626 a. Predictors: (Constant), service quality and relationship quality.					

Multiple regression analysis was run to investigate the combined effects of quality factors on data warehouse net benefits and to determine the influence of service quality on relationship quality. Based on the coefficient of determination in Table 10, (R^2)

value was 0.614% indicating that that amount of variation in the dependent variable is explained by the independent variables. In other words, 61.4% of the relationship quality is explained significantly by net benefits.

Moving on to the influence on relationship quality, Table 11 shows that adjusted coefficient of determination (R^2) is 0.487% indicating that 48.7% of the variance (R^2) in relationship quality is significantly explained by service quality.

Table 11: Regression Results of Service Quality with Relationship Quality

Variables	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	1.748	0.382		5.625	0.000
Service Quality	0.638	0.061	0.682	9.739	0.000
Dependent Variable: Relationship quality. R=0.698 [a], R2=0.487, Std. Error of the Estimate =0.84988 a. Predictors: (Constant), Service quality.					

Discussion of Results

H1: Service quality is positively associated with data warehouse net benefits.

Based on the study findings, service quality positively and significantly impacted net benefits at the level of significance of 0.000 with the correlation coefficient of 0.686. The result indicates that superior services provided by the data warehouse system will lead to more productive users, and better organizational performance. This result is consistent with those reported by prior studies including [22], which found service quality to be significantly and positively related to net benefits obtained from e-government, and [23] who found responsiveness of perceived developer and user training provided by the computing department to significantly affect system usefulness. Also consistent with the

result is [24] study that found the ability to respond to problems by IS users to be positive related to enhancing organizational efficiency.

On the basis of the several reasons, the conclusion was achieved; delivery of timely IS services by the IT unit could result in timely and efficient decision making, which would ultimately achieve superior organizational efficiency. The employment of knowledgeable data warehouse specialists that are skilful in maintaining effective communication throughout interactions with business units could lead to optimum services that are consistent with the objectives of the organization. Moreover, the focus on the best interests of users would lay the ground for understanding their needs better and thus, improving profitability and quality decision making. Better services could through data warehouse systems could also allow timely responses and leveraging of new business opportunities. In conclusion, organizations are in need of data warehouse systems to be able to provide sufficient solutions for decision making, dependable service and successful achievements.

H2: Service quality is positively associated with relationship quality.

This study found that service quality positively and significantly affected relationship quality at the level of significance of 0.000 with the correlation coefficient at 0.679 indicating that 67.9% of the variance in the relationship quality was significantly explained by the system quality. This finding reveals that good IS departments services would lead to enhanced relationship between data warehouse parties. Prior studies also found similar results like [18] who reported the significant correlation between service quality and relationship quality in successful e-commerce website. Added to this, [25] also evidenced the positive relationship between service quality and relationship quality in the case of successful IS outsourcing.

H3: Relationship quality is positively associated with data warehouse net benefits.

In this regard, the study found a positive and significant relationship between relationship quality and net benefits at the level of confidence of 0.000, and correlation coefficient value of 0.671. The relationship quality was found to partially mediate the service quality-net benefits relationship, indicating that good communication, coordination, cooperation, commitment and trust between the data warehouse parties could promote successful data warehouse systems implementation and use.

Prior studies reported consistent results like [21], who revealed a significant relationship between relationship quality and net benefits through the former's effect on use and user satisfaction in the context of e-commerce systems. Similarly, [19] reported a significant relationship between relationship quality and user satisfaction in the case of IS outsourcing. Also, [21] evidenced a significant and positive relationship between relationship quality and organizational performance in CRM implementation. In data warehouse studies, [2] revealed that commitment; communication and cooperation among the business users and managers of data warehouse significant related to successful data warehouse systems.

The positive and significant relationship may be attributed to the following reasons; the relationship quality between data warehouse units/parties can minimize the required time and effort, and lead to timely and accurate decision making. Along the same line of argument, data warehouse managers and business managers should both be responsible for continuous collaboration via robust partnerships and suitable resources allocation. Aside from the above, effective communication, coordination and cooperation between the parties of the data warehouse, promotes the determination of weaknesses and their rectification for the optimum return on investments.

The model developed in this study had three main concepts namely service quality, relationship quality and net benefits. Analysis using descriptive analysis, factor analysis, correlation analysis and multiple regression analysis resulted in the support of

all hypotheses. Moreover, 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. In addition, the results indicated that the direct causal effect of information quality on system quality was statistically significant and positive. The results also indicated that the direct causal effect of service quality on relationship quality was statistically significant and positive. Furthermore, the results indicated that the direct causal effect of user quality on business quality was statistically significant and positive.

This finding is justified by the fact that the use of modern technology and formal development methods when developing the data warehouse systems could facilitate to improve the quality of information by provides adequate information and produces relevant and integrity information. In addition, improvements in system quality can help provide easy-to-understand information outputs and timely reports, and changed information needs can be quickly met. Furthermore, a poor system (software and hardware) could place the organization at a competitive disadvantage because of its inability to provide quality information, specifically in terms of accuracy and content.

Conclusion and Future Research

Service quality and relationship quality are factors that are significant to the evaluation of successful data warehouse systems but little thought has been paid on what data warehouse success means, the required factors to achieve it, and the realistic expected benefits.

In this background, vision appears to prevent the ability of data warehouse managers to be creative. Majority of them, particularly the experienced ones, lack the incentive to envision alternatives to achieve the objectives of data warehouse projects. This is particularly true as it seems that data warehouse systems

successful implementation will change in the future and this will call for the re-thinking and re-evaluation of what a successful warehouse system constitutes prior to the complete determination of what it is in the present time.

Based on the current trend of IS/DW success studies, quality factors could be gaining increasing interest and hence, more studies are stressing for greater focus on them in subsequent studies. The present research managed to highlight several practical and theoretical issues for the success of data warehouse systems. Several reasons can be enumerated to pursue this line of study and among them, data warehouse systems would likely cost more than expected but although it is riddled with risks, it offers great rewards for decision makers.

On a final note, the present study covered only some aspects of data warehouse systems success and as such, there may be some other aspects that have not been considered in the study's research model. Future studies are suggested to refine the overall data warehouse success scale and validate it in their study. Future studies could also include new aspects like work quality into the proposed scale to validate the measurement of overall data warehouse success.

Data warehouse managers should aim at developing valuable, inimitable, and non-substitutable data warehouse system capabilities to increase competitive advantage to the organization. The researcher believe that the findings of this study would be useful for data warehouse managers in enabling them to take into consideration the key determinants identified in this study and explore how well these organizations could successfully develop strategies and action plans for the data warehouse systems.

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تأثير جودة الخدمات وجودة العلاقات لتنفيذ نظام مستودعات البيانات الناجح بأستخدام تطبيق نموذج نجاح انظمة المعلومات

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المستخلص

يعتبر مستودع البيانات (DW) ذو دلاله على بنية النظام بدلا من إي منتج أو تطبيق برمجيات أخرى، وتستخدم تلك المستودعات لتحسين البنية التحتية لتكنولوجيا المعلومات . ومع ذلك، فإن معظم الشركات تعترف بعدم الاستفادة من هذا النظام لتحقيق أهدافها والتي ما يزال نسبه التنفيذ الناجح لها منخفضاً. قدمت هذه الدراسة لمناقشة نتائج النموذج القائم على نموذج نجاح نظام المعلومات، ولا سيما العلاقة بين عوامل الجودة والفوائد التي تم الحصول عليها من نظام مستودع البيانات. وقد تم اختيار المتغيرات المستقلة لقياس جودة الخدمة وعلاقة خدمة جودة ، في حين أن المتغير التابع يقيس المنافع التي تم الحصول عليها من النظام. وقدمت الدراسة على خلفية مستودع البيانات والتنفيذ الناجح لمستودع البيانات، فضلاً عن ذلك وصف هذا البحث النموذج والفرضيات المقترحة التي تشمل بعض من العوامل التي وفرت لهذه الدراسة نظرة عميقة حول تلك العوامل التي تؤثر على نجاح مستودع البيانات باستخدام نموذج نجاح مستودع البيانات الذي قدم في نهاية المطاف استدلالات مستنيرة لاتخاذ القرارات بشأن التنفيذ الناجح لمستودعات البيانات

الكلمات الرئيسية: مستودع البيانات، نموذج نجاح نظام المعلومات، جودة الخدمة وجودة العلاقة.