

IDENTIFYING INFORMATION QUALITY DIMENSIONS THAT AFFECT CUSTOMERS SATISFACTION OF E-BANKING SERVICES

¹MOHANNAD MOUFEEED AYYASH

¹Asstt Prof, Department of Computer Science, Shaqra University

E-mail: ¹mohannad.ayyash@gmail.com

ABSTRACT

Information quality has been evidenced to be significantly related with the use of the system in prior empirical study particularly in the e-commerce systems. However, contended that while the importance of information quality is indisputable, it is a subject that is under-explored. Therefore, this study is an attempt to determine the dimensions of information quality that influences customer satisfaction of services provided by e-banking, and to propose an information quality model for customer satisfaction. The study proposed a model on the basis of the information system success model and based on such model, the researcher highlighted general information quality dimensions that influence customer satisfaction of services provided by e-banking.

Keywords: *Information Quality Dimensions, Customers Satisfaction, E-Banking Services.*

1. INTRODUCTION

In the banking sector, information systems are extensively utilized as such systems are suitable to banking organizations in terms of their nature and intensive information. Thus, the banking industry has primarily invested heavily in IT this has impacted the industry. Nevertheless, not all investments contribute to guaranteeing good information quality [1]. A prior study by [2] pointed out to the significance of IT role in assisting the survival and prosperity of organisations in the marketplace. Accordingly, information was found to be one of the most significant factors required to reinforce IT use. Despite the fact that this area of study is considered to be a novel branch, increasing developments are noted in the field of information quality [3].

In the past, transactions by banking firms were carried out in the firms with the use of ATM or telephone. But in the current times, commercial websites have top place in communication channels used by consumers to achieve their needs with ease of use and convenience. Consequently, the establishment of high quality communication channels is expected to improve customer satisfaction and maximize the competitive edge of banking [4]. Hence, e-banking has been considered to be one of the most successful business-to-consumer application in the field of e-commerce [5].

In e-banking financial organisations are afforded outstanding service channels that add to their competitiveness in meeting consumer needs via the development of new distribution channels – channels that enhance the banks' images and minimizes their costs [6]. Moreover, e-banking allows customers to avail of convenient services such as bills payment, accounts management and convenient shopping any time at any place.

In this context, information systems (IS) that furnishes high content quality adds convinces user's intention to engage in the provided services [7]. Hence, it is important that information quality achieved in order to enhance user's satisfaction of the provided e-banking services. In this regard, IS provided information quality is considered to be a significant factor that convinces customers that it is a useful system [8].

In relation to this, information quality has been evidenced to be significantly related with the use of the system in prior empirical study [9] particularly in the e-commerce systems [10]. In addition [11] contended that while the importance of information quality is indisputable, it is a subject that is under-explored. In answer to this call for more research, this study explores the dimensions of information quality that influences the satisfaction of customers in using e-banking services. In other words, the issue related with wider e-banking service is addressed by the present research aim to determine the information quality dimensions that affect customer satisfaction of e-banking services and to



develop and propose an information quality model to achieve customer satisfaction in Palestinian e-banking services.

THEORETICAL BACKGROUND

The increasing growth of e-commerce and the ICT in the e-banking landscape does not appear to comply with specific time or location in terms of being a novel type of non-traditional banking that exceeds the normal pattern of traditional banks. Such e-banking effectively contribute to the provision of various services at low costs and at expedient timings. Nevertheless, generally speaking, e-banking should not just be relegated to just a banking branch in that it provides financial services but it should also be deemed as a financial, commercial and administrative position representing the top challenge the current banking environment. Consequently, a strong competitive scenario is expected to arise among commercial banks and financial institutions based upon which the customers will compare between the banking services to select ones that are most convenient and appropriate for their use. Hence, it is crucial for banks to concentrate on the factors that lead to the realisation of customer satisfaction via the services provided.

Furthermore, the IS role in the provision of competitive edge is currently a debatable subject [12]. One of the argument given is pertains to the fact that it not the IS solution but IS use that leads to the firm's competitive edge. Nevertheless, it has been agreed that such systems ongoing advancements make them quite costly and banks should be cognisant of the above factors to provide successful e-banking services. In this context, e-banking success should be gauged via customer's satisfaction of the service provided by it as such satisfaction indicates the customer's acceptance towards system use, which could result in successful system use, and the reduction of developing another new system.

According to the reviewed literature in the field, there are several definitions and measures provided regarding IS success. Specifically, [13] carried out an extensive and thorough review of literature dedicated to the topic and proposed a model of IS success that provides a reliable indicator of the IS success through the identification of its six interconnected dimensions namely system quality, information quality, use, user satisfaction, individual impact and organisational impact. A later study by the same authors [14] revised their model, made minor changes to it and including the

following dimensions in the updated model; system quality, information quality, service quality, use, user satisfaction and net benefits. Their revised updated model was supported by empirical studies that showed several imperative implications of the model in both research and practice. The model has also been evidenced by prior studies to support governmental and private organisations with information quality, system quality, service quality, system use, user satisfaction and perceived net benefit in their assessment methods of successful IS ([15], [16], [17], [18], [19], [20], and [21]).

In the quest to answer the call for the more studies to minimise the gap in literature, the present study aims to identify the dimensions of information quality that influence user's satisfaction of e-banking services using IS success model [14] in the context of Palestine.

2. INFORMATION SYSTEM SUCCESS MODEL

In their quest to determine IS success,[13] proposed an Information System Success Model that has to date, been validated by different researchers such as [9], [23] and that has been adopted for consumer e-commerce analysis [24], [10]. The model has also been employed for the assessment of e-government system success and its validity in such assessment has been reported [25]. Initially, DeLone and McLean [13] proposed the model to assess IS success and provide a platform for future research in their studies. They enumerated six dimensions for successful IS and these included system quality, information quality, use, user satisfaction, individual impact and organisational impact – such variables stem from the combination of a several studies dedicated to examining successful IS. The variables mentioned are interconnected as opposed to being independent.

Despite the fact that the DeLone and McLean [13] is deemed to be the pioneering model, it has its drawbacks and such drawbacks is what urged [14] improvement and update of the model to cover the studies carried out from 1992 to 2003. The significant improvements made in the model are; the inclusion of service quality to indicate the significance of service in supporting e-commerce system success, the inclusion of intention to use to gauge user's attitude (alternative to use), and the conflation of individual impact and organisational impact in the construct of net benefits.

In relation to the updated model, [14] stated that a system can be assessed in light of its information

quality, system quality and service quality – features that influence the intention to use or the repetitive use, and user's satisfaction. The system use will bring forth specific benefits (net benefits) that are either positive or negative and they impact user's satisfaction and repetitive use of the system [26]. Accordingly, in the present study, DeLone and McLean [14] model was employed, where information quality was considered as a factor that influences user satisfaction of e-banking service in the context of Palestine, and intention to use as a significant predictor of actual use of the system as indicated in literature by [27], [28].

3. INFORMATION QUALITY DIMENSIONS, USERS SATISFACTION

In the current business markets, information has become the most critical resource and in this regard, institutional and individual processes that hinge on information, the quality of such information is among the key predictors of their decisions and actions in light of the quality aspect [29]. In fact, in today's world, where customers have become quite demanding, the financial service firms are becoming more customer-focused [30].

In a related study, [31], confirmed that the launching of e-banking services may significantly transform how banks develop and sustain their customer relationship, and that the increasing internet use in the future will add to the customers' expectations and perceptions – which in turn, would make information quality a significant issue. Hence, shedding a light on the issues of information quality in the context of a new delivery channel is important as poor information quality of e-banking services can have an adverse impact on the successful banking activities. Added to this, providing quality information has become a requirement for the realization of customer satisfaction as only through such satisfaction the company can achieve and maintain customer loyalty [32].

Literature concerning IS is rife with the examination of information quality provided by systems but the web quality is still deemed to be a concept that is full of complexity owing to its multidimensional nature [33]. This indicates that the major issue in assessing information system quality is the identifying of conditions/predictors of quality [34]. The conditions stem from the different dimensions and interdependent nature of quality in IS, that are largely dependent on the system's objectives and context [35]. Moreover, the perceived information quality-user satisfaction is

strongly evidenced in prior studies [18], [36]. In particular, this relationship is reinforced in the individual unit of analysis ([9]; [37];[38];[39]; [40]; [41]).

Perceived information quality refers to the individual's evaluation of the performance of the system in light of its provision of information according to his/her experience in system use [42], [43]. Information quality is deemed to be the measure of the system's output [14] and this is the reason why users generally conduct an assessment of the information value based on their required characteristics (e.g. accuracy, completeness and timeliness). Such attributes have been widely studied in the studies dedicated to IS literature [14].

It should be kept in mind that information quality (IQ) has multiple dimensions that has been examined by several researchers in their identification and classification of its dimensions. Some examples of system quality dimensions mentioned in literature include believability, interpretability, reputation, value-added, completeness, objectivity, reliability, security, timeliness, price, verifiability, accuracy, availability, latency and time of response [44]. Additionally, [45] contended that information quality covers the complete, accurate, organised, comprehensible, current and timely information that is provided in the system's website. The dimensions of information quality mentioned in literature are summarised in (Table 1). See Appendix A.

Table 1 indicates that the most widely used information quality dimensions in the IS field are accuracy, timeliness, completeness and relevancy of information, and owing to their high frequencies, they are adopted as information quality dimensions in the present study. These dimensions are used to examine information quality of e-banking services in the context of Palestine. The relevant dimensions are explained further in the next sections.

Accuracy

Accuracy is operationalised to identify the level of correctness and reliability of information [46]. In terms of the accuracy of IS in e-banking, the spelling, rules, facts and information consistency and continuity are focused upon on the site. Also, the content is scrutinised concerning its documentation, diversity of sites, related magazines, and electronic catalogues and books. Moreover, information accuracy is considered to be the e-banking accurate, updated, and credible information that could lead to customer satisfaction

of e-banking services. The following hypothesis is therefore proposed;

H1: The accuracy of information will positively affect customer satisfaction of e-banking services.

Timeliness

Timeliness of information refers to the availability of output information at the required time [47]. In the present study, this is considered to be the rapid delivery of information to the e-banking customers and its accuracy, as information becomes useless when there is no longer need for it. With such rapid and accurate delivery of information, customer satisfaction is expected to arise when using e-banking services and thus, the following hypothesis is proposed;

H2: The information timeliness will positively affect customer satisfaction of e-banking services.

Completeness

Completeness is described as the level to which information is robust in terms of its breadth and depth, to address the task that needs completion [47]. In this study, completeness of information refers to the information needs of current and future customers that are met by the information resource. In this regard, incomplete and inaccurate information can mislead customers indicating that in order to improve the confidence of customers in the information provided by e-banking, it has to be complete in light of its relative importance as well as its cost. Any deletion of information provided by e-banking may also lead to misleading actions and decisions of customers as the information may not be suitable and its reliability is lost. According to the above explanation, the researcher hypothesises that;

H3: The information completeness will positive affect customer's satisfaction of e-banking services.

Relevancy

Relevancy refers to the level to which information can be applied and be helpful to tackle the task at hand [47]. Relevant information is invaluable to the tasks for which the information is sought after [47]; [48]. But information is only useful when it satisfied customer's e-banking needs. Therefore, the following hypothesis is proposed;

H4: The information relevancy will positively affect customer's satisfaction of e-banking services.

4. USER SATISFACTION AND INTENTION TO USE

The ever-changing customer desires, and in turn demands, contributes to the complexity that characterised the organisational environment, the increasing competition and the markets (breadth). Such factors urge organisations to re-evaluate their adopted managerial concepts like customer satisfaction in order to obtain and maintain competitive advantage qualifying them to discern between local and international rivals.

Organisational customers are what make the organisation and as such, there is no need to establish an organisation or to provide service without customers. It is also evident that successful firms often concentrate their activities and functions to achieve customer satisfaction. In the past twenty years, customer satisfaction has been strategically significant for several firms. For the purpose of the present study, customer satisfaction refers to the satisfaction of customers with the provided e-banking services in Palestine.

According to [23], user satisfaction is the culmination of feelings of pleasure or displeasure stemming from the total benefits that a person is expected to receive from his/her interaction with the IS. The concept has also been defined as the major factor in intention to use new technology [49]; [50]. Prior studies have evidenced the positive impact of satisfaction on future intentions to use [51] and thus, the following hypothesis is proposed;

H5: User satisfaction will positively affect intention to use e-banking services.

5. RESEARCH MODEL

The pioneering use of the IS Success Model was first noted in studies concerning the use and adoption of the internet, and web for e-commerce in the form of e-banking and e-shopping in the late 1990s [52]; [53]. Additionally, frameworks of information quality were developed and proposed over the prior years by different authors pertaining to different fields [47], [14], [54], [55], [45], [56], [57], [58], [59], [60]. Such studies generated common information quality predictors although little studies were dedicated to revealing information quality dimensions that influence user satisfaction in the context of e-banking service in Palestine. Based on the relevant dimensions adopted in this study, the researcher developed

hypotheses that form the basis of the research model with the aim of identifying the dimensions that affect user satisfaction of e-banking in Palestine. The present study's proposes the following model (Figure 1).

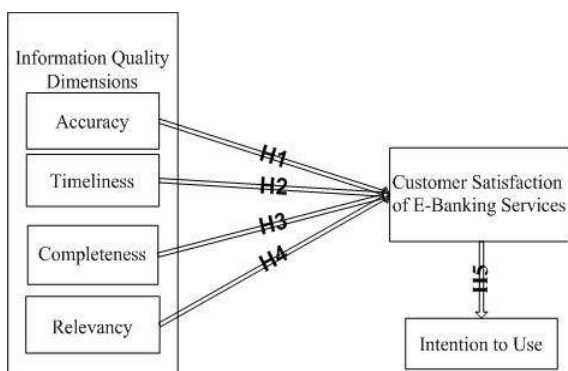


Figure 1: Research Model

6. RESEARCH METHODOLOGY

The objectives, information availability and the costs of conducting a research consist of major factors impacting the research strategy selection [61]. In the present study, a quantitative method to achieve the objectives as such a method meets the aims of answering questions regarding the relationships among the measured variables in order to explain, predict and control the phenomenon under study [62]. In particular, data was gathered from 250 customers from Palestinian banks through a distributed structured questionnaire, whose items are adopted from literature. The study sample was chosen through the use of random sampling applied to customers of several Palestinian banks.

7. CONCLUSIONS

E-banking aims to provide better and convenient services to customers, where customers are able to access their banking information and services at any place, at any time they need it. Time spent for travelling to and fro, and for queuing are considerable lessened. In this regard, online services are also more expedient compared to face-to-face services. Banking is a service where the more the customer use e-services, the more the operation and management costs are reduced. As such, banks are exerting efforts to provide effective e-services to their customers via e-banking.

This study has several contributions, with one of them being the identification of the dimensions of information quality based on a thorough literature review, and proposing an information quality model based on DeLone & McLean's IS Success Model [14]. for customer's satisfaction of e-banking services in Palestine. The suggested model focuses on the dimensions of information quality of e-banking used by customers namely accuracy, timeliness, completeness and relevancy. To this end, the suggestion of such a model in banking sectors of developing countries, like Palestine could lead to the enhancement of banking operations as this would enable banks to modify their services in order to improve or maintain their quality of service. Future studies can empirically test the proposed model by employing a survey questionnaire strategy after which the findings could clarify and enrich the proposed model. The findings of this study can be used by decision makers in terms of dimensions of service quality that could contribute to achieving customer satisfaction and to promoting customer's intention to use of e-banking services.

REFERENCES

- [1] L. Harold, "An Empirical Evaluation of the Role of Information Quality on IS Success in the Indian Financial Services Sector", *Global Business and Management Research: An International Journal*, Vol. 4, No. 3, 2012, pp. 255-266.
- [2] H. Freitas, et al, "Informação e Decisão: sistemas de apoio e seu impacto", Porto Alegre: Ortiz, 1997.
- [3] L. F. R., Lima, A. C. G., Maçada, and X. Koufteros, "A Model for Information Quality in the Banking Industry-The Case of the Public Banks In Brazil", In *ICIQ*, 2007, pp. 549-562.
- [4] O., Karatepe, M., Yavas, U., and E. Babakus, "Measuring service quality of banks: Scale development and validation", *Journal of Retailing and Consumer Services*, Vol. 12, 2005, pp. 373-383.
- [5] K. Pousttchi, and M. Schurig, "Assessments of Today's Mobile Banking Applications From the View of Customer Requirements", *Proceedings of the Hawai'i International Conference on System Sciences*, January, 2004, pp. 5-8.
- [6] R. Lam, and S. Burton, "Bank selection and share of wallet among SMEs: Apparent differences between Hong Kong and Australia",



- Journal of Financial Services Marketing, Vol. 9, No.3, 2005, pp. 204–213.
- [7] T. Ramayah, N.H. Ahmad, and Lo, M.C, “The role of quality factors in intention to continue using an e-learning system in Malaysia”, *Procedia-Social and Behavioural Sciences*, Vol. 2, No. 2, 2010, pp.5422–5426.
- [8] J. Chuan-Chuan Lin, and H. Lu, “Towards an understanding of the behavioural intention to use a web site”, *International Journal of Information Management*, Vol. 20, No. 3, 2000, pp.197–208.
- [9] A. Rai, S.S. Lang, and R.B. Welker, “Assessing the validity of IS success models: an empirical test and theoretical analysis”, *Information Systems Research*, Vol. 13, No. 1, 2002, p.50.
- [10] A. Molla, and P. S. Licker, “E-commerce systems success: An attempt to extend and respecify the DeLone and McLean model of IS success”, *Journal of Electronic Commerce Research*, Vol. 2, No. 4,2001, pp. 131-141.
- [11] L. F. R., Lima, et al., “A Model for Information Quality in the Banking Industry: The Case of the Public Banks in Brazil”, the 12th International Conference on Information Quality, MIT Sloan School of Management, 2007.
- [12] A. N. Zaied, “An Integrated Success Model for Evaluating Information System in Public Sectors”, *Journal of Emerging Trends in Computing and Information Sciences*, Vol. 3, No. 6, 2012, pp. 814- 825.
- [13] W.H. Delone, and E.R. Mclean, “Information systems success: the quest for the dependent variable”, *Information Systems Research*, Vol. 3, No. 1, 1992, pp.60–95.
- [14] W.H. Delone, and E.R. Mclean, “The DeLone and McLean model of information systems success: A ten-year update”, *Journal of Management Information System*, Vol. 19, No. 4, 2003, pp. 9-30.
- [15] G. J. Udo, K. K. Bagchi, and P. J. Kirs, “Using SERVQUAL to assess the quality of e-learning experience”, *Computers in Human Behavior*, Vol. 27, No 3, 2011, pp. 1272-1283.
- [16] H. F. Lin, “Knowledge sharing and firm innovation capability: an empirical study”, *International Journal of Manpower*, Vol. 28, No.3, 2007, pp. 315-332.
- [17] J. M., Field, G. R. Heim, and K. K. Sinha, “Managing quality in the e-service system: development and application of a process model”, *Production and Operations Management*, Vol. 13, 2004, pp. 291–306. doi: 10.1111/j.1937-5956.2004.tb00219
- [18] J. Livari, “An empirical test of the DeLone-McLean model of information system success”, *ACM SIGMIS Database*, Vol.36, 2005, pp. 8-27. DOI: 10.1145/1066149.1066152
- [19] C. Flavián, M. Guinalú, and E. Torres, “How bricks-and-mortar attributes affect online banking adoption”, *International Journal of Bank Marketing*, Vol. 24, No. 6, 2006, pp.406–423.
- [20] M.M. Ayyash, K. Ahmed and D. Singh, “A hybrid information system model for trust in e-government initiative adoption in public sector organisation”, *International Journal of Business Information System*, Vol. 11, No. 2, 2012, pp. 162-179.
- [21] M.M. Ayyash, K. Ahmed and D. Singh, “Investigating the effect of information systems factors on trust in e-government initiative adoption in Palestinian public sector”, *Research Journal of Applied Sciences, Engineering and Technology*, Vol. 5, No. 15, 2013, pp. 3865-3875.
- [22] S. Sang, and J.D. Lee, “A conceptual model of e-government acceptance in public sector”, *IEEE, Third International Conference on Digital Society*, 2009, pp.71–76.
- [23] P.B. Seddon, and K. Min-Yen, “A partial test and development of the Delone and Mclean model of is success”, *ICIS Proceedings*, 1994, pp.99–110.
- [24] W.H. Delone, and E.R. Mclean, “Measuring e-commerce success: applying the DeLone & McLean information systems success model” *International Journal of Electronic Commerce*, Vol. 9. No. 1, 2004, pp. 31–47.
- [25] Y-S. Wang, and Y-W. Liao, “Assessing eGovernment systems success: a validation of the DeLone and McLean model of information systems success”, *Government Information Quarterly*, Vol. 25, No. 4, 2008, pp.717–733.
- [26] M.S. Featherman, and P.A. Pavlou, “Predicting e-services adoption: a perceived risk facets perspective”, *International Journal of Human-Computer Studies*, Vol. 59, No. 4, 2003, pp.451–474.
- [27] P.Y.K. Chau and P.J.H. Hu, “Information technology acceptance by individual professionals: a model comparison approach”, *Decision Sciences*, Vol. 32, No. 4, 2001, pp.699 719.



- [28] V. Venkatesh, M.G. Morris, G.B. Davis, and F.D. Davis, "User acceptance of information technology: toward a unified view", *MIS Quarterly*, Vol. 27, No. 3, 2003, pp.425–478.
- [29] B., L. Stvilia, Gasser, et al. "A framework for information quality assessment", *Journal of the American Society for Information Science and Technology*, Vol. 58, No. 12, 2007, pp. 1720-1733.
- [30] M. E. González, G. Quesada, et al. "Customer satisfaction using QFD: an e-banking case", *Managing Service Quality: An International Journal* Vol. 14, No. 4, 2004, pp. 317-330.
- [31] N.P. Mols, "The Internet and banks' strategic distribution channel decisions", *International Journal of Bank Marketing*, Vol. 17, No. 6, 2000, pp. 295-300.
- [32] Grönroos, C. (2000) 'Service Management and Marketing: a customer Relationship Management Approach, 2nd Ed. England: John Wiley & Sons, Ltd.
- [33] A. M. Aladwani, and P. C. Palvia, "Developing and validating an instrument for measuring user-perceived web quality". *Information & Management*, Vol. 39, No. 6, 2002, pp. 467-476.
- [34] Buyukozkan, G., Ruan, D., and Feyzioglu, O. (2007) 'Evaluating e-learning web site quality in a fuzzy environment'. *International Journal of Intelligent Systems*, Vol. 22, No. 5, pp. 567-586.
- [35] M. Alkhattabi, and D. Neagu, et al, "Information quality framework for e-learning systems", *Knowledge Management & E-Learning: An International Journal*, Vol 2, No. 4, 2010, pp. 340-362.
- [36] J.H. Wu, and Y.M. Wang, "Measuring KMS success: a re-specification of the DeLone and McLean model", *Information & Management*, Vol. 43, No.6, 2006, pp. 728–739.
- [37] T. McGill, V. Hobbs, and J. Klobas, "User developed applications and information systems success: A test of DeLone and McLean's model", *Information Resources Management Journal*, Vol. 16, No.1, 2003, pp. 24-45.
- [38] B. H. Wixom, and P. A. Todd, "A theoretical integration of user satisfaction and technology acceptance", *Information Systems Research*, Vol. 16, No. 1, 2005, pp. 85-102.
- [39] U.R. Kulkarni, S. Ravindran, and R. Freeze, "A knowledge management success model: theoretical development and empirical validation", *Journal of Management Information Systems*, Vol. 23, No. 3, 2006, pp. 309–347.
- [40] C.M. Chiu, C.S. Chiu, and H.C. Chang, "Examining the integrated influence of fairness and quality on learners' satisfaction and Web-based learning continuance intention", *Information Systems Journal*, Vol.17, No.3, 2007, pp.271-287.
- [41] L.A. Halawi, R.V. McCarthy, and J.E. Aronson "An empirical investigation of knowledge-management systems' success", *The Journal of Computer Information Systems*, Vol. 48, No.2, 2007, pp. 121–135.
- [42] V. McKinney, K. Yooh, F.M. Zahedi, "The measurement of web-customer satisfaction: an expectation and disconfirmation approach", *Information Systems Research*, Vol. 13, 2002, pp. 296–315.
- [43] R.R. Nelson, P.A. Todd, H.W. Barbara "Antecedents of information and system quality: an empirical examination within the context of data warehousing", *Journal of Management Information Systems*, Vol. 21, 2005, pp. 199–235.
- [44] F. Naumann, and C. Rolker, "Assessment methods for information quality criteria", In *Proceedings of 5th International Conference on Information Quality*, 2000, pp.148–162.
- [45] R. Hussein, N.S.A. Karim, N. Mohamed and A.R. Ahlan et al., "The influence of organizational factors on information systems success in e-government agencies in Malaysia", *Electronic Journal of Information System, Develop Countries*, 2007.
- [46] R. Y. Wang, and D. M. Strong, "Beyond accuracy: What data quality means to data consumers", *Journal of management information systems*, Vol. 12, No. 4, 1996, pp. 5-33.
- [47] J. E. Bailey, and S. W. Pearson, "Development of a Tool for Measuring and Analyzing Computer User Satisfaction", *Management Science*, Vol. 29, No. 5, 1983, pp. 530-545.
- [48] K. Huang, Y. W. Lee, and R. Y. Wang, "Quality Information and Knowledge", 1999, Upper Saddle River, NJ: Prentice Hall.
- [49] S. Negasha, T. Ryanb, and M. Igbaria, "Quality and effectiveness in Web-based customer support systems", *Information & Management*, Vol. 40, No. 8, 2003, pp. 757-768.
- [50] Y. Yoon, T. Guimaraes, and Q. O'Neal, "Exploring the factors associated with expert



- systems success”, MIS Quarterly, Vol. 19, No. 1, 1995, pp. 83-106.
- [51] L. Oliver, Richard, “A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions”, Journal of Marketing Research, Vol. 17, 1980, pp. 46-49.
- [52] H. Bell, and N. Tang, “The effectiveness of commercial Internet web sites: A user’s perspective”, Internet Research, Vol. 8, No. 3, 1998, pp. 219-228.
- [53] E. K. Huizingh, “The content and design of web sites: an empirical study”, Information & Management, Vol. 37, No.3, 2000, pp.123-134.
- [54] G. Shanks, and B. Corbitt, “Understanding data quality: Social and cultural aspects”, In Proceedings of the 10th Australasian Conference on Information Systems, 1999.
- [55] A. Dedeke, “A conceptual framework for developing quality measures for information systems”, In Proceeding of the 5th International Conference on Information Quality, pp. 126-128, 2000.
- [56] P. Katerattanakul, and K. Siau, “Measuring Information Quality of Web Sites: Development of an Instrument”, Proceedings of the Twentieth International Conference on Information Systems, Charlotte, North Carolina, pp. 279-286, 1999.
- [57] H.K.N. Leung “Quality metrics for intranet applications”, Information & Management, Vol. 38, No.3, 2001, pp. 137-152.
- [58] B.K. Kahn, D.M. Strong, and R.Y Wang, “Information quality benchmarks: product and service performance”, Communications of the ACM, Vol. 45, No.4, 2002, pp. 184–192.
- [59] M. Eppler, and P. Muenzenmayer, “Measuring information quality in the web context: A survey of state-of-the-art instruments and an application methodology”, In Proceedings of 7th International Conference on Information Quality, pp.187–196, 2002.
- [60] B. Stvilia, , M.B. Twidale, , L.C. Smith, and L. Gasser, “Assessing information quality of a community-based encyclopaedia”, In proceedings of the International Conference on Information Quality (ICIQ), Cambridge, MA, pp. 442-454, 2005.
- [61] W. G. Zikmund, “Business research methods”, 2003, Ed. Mason: Ohio: South-Western.
- [62] P. D. Leedy, and J.E. Ormord, “Practical research: Planning and design”, 2005, Ed, 8, Saddle River, New Jersey Prentice Hall.



APPENDIX A:

Table 1: Information Quality Dimensions in IS Studies.

Information Quality Dimension \ Study	Timeliness	Accessibility	Security	Consistency	Accuracy	Format	Ease of understanding	Completeness	Validity	Comprehensives	Relevancy	Convenience	Currency
Bradley&Byrd.,2006	✓							✓					
Lee,Strong, Kahn at el.,2002					✓						✓		
Hussein., et al 2007	✓							✓			✓		
Liu & Huang 2005					✓			✓			✓		
Delone and McLean, 2003									✓			✓	
Lee,Strong,Kahn.atel.,2002	✓				✓			✓					
Doll&Torkzadeh,1988	✓												
Strong, Lee & Wang (1997)	✓	✓	✓		✓		✓	✓					
Miller (1996)	✓	✓				✓			✓				
Jennexnet al.,1998					✓								
S.F. Lin at el., 2006					✓								
J.livari, 2005	✓				✓			✓			✓		
Molla&Licker, 2001	✓				✓			✓			✓		
Redman (1996)										✓			
Fox et al. (1994)				✓				✓		✓		✓	
Nelson, R. Ryan., et al 1987					✓	✓		✓					✓
Rainer, R.K., et al 1995	✓				✓						✓	✓	
Wang &Strong; 1996.	✓				✓			✓			✓		
Eppler&Muenz-enmayer 2002	✓				✓		✓	✓			✓		
Khan et al. 2002		✓	✓	✓									
Pipino et al. 2002	✓	✓			✓			✓			✓		
Wixsom & Watson 2001					✓						✓		
Alexander & Tate 1999		✓			✓						✓		
Stvilia 2006	✓			✓	✓			✓					
S.F. Lin at el.,2006	✓				✓			✓			✓		
Frequencies	14	5	2	3	19	2	2	14	2	2	12	3	1