RELATIONSHIP BETWEEN INFORMATION QUALITY AND DECISION EFFECTIVENESS: A STUDY IN THE BANKING SECTOR IN JORDAN

By

FARES FAWZI FARES ALDEEK

Thesis Submitted to the Centre for Graduate Studies,
Universiti Utara Malaysia,
In Fulfillment of the Requirement for the Degree of Doctor of Philosophy

Kolej Perniagaan
(College of Business)
Universiti Utara Malaysia

PERAKUAN KERJA TESIS / DISERTASI
(Certification of thesis / dissertation)

Kami, yang bertandatangan, memperakukan bahawa
(We, the undersigned, certify that)

FARES FAWZI FARES AL-DEEK

calon untuk Ijazah **DOKTOR FALSAFAH (Ph.D)**
(candidate for the degree of)

telah mengemukakan tesis / disertasi yang bertajuk:
(has presented his/her thesis / dissertation of the following title):

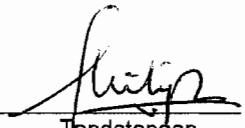
"RELATIONSHIP BETWEEN INFORMATION QUALITY AND DECISION EFFECTIVENESS: A STUDY IN THE BANKING SECTOR IN JORDAN "

seperti yang tercatat di muka surat tajuk dan kulit tesis / disertasi.
(as it appears on the title page and front cover of the thesis / dissertation).

Bahawa tesis/disertasi tersebut boleh diterima dari segi bentuk serta kandungan dan meliputi bidang ilmu dengan memuaskan, sebagaimana yang ditunjukkan oleh calon.
That the said thesis/dissertation is acceptable in form and content and displays a satisfactory knowledge of the field of study.

Pengerusi Viva *(Chairman for Viva)*	:	**Prof. Ir. Dr. Che Sobry Abdullah**	Tandatangan *(Signature)*	
Pemeriksa Luar *(External Examiner)*	:	**Assoc. Prof. Dr. Abdul Malek A. Thambi**	Tandatangan *(Signature)*	
Pemeriksa Dalam *(Internal Examiner)*	:	**Prof. Dr. Rosli Mahmood**	Tandatangan *(Signature)*	

Pelajar *(Name of Student)*	:	**Fares Fawzi Fares Al- Deek**
Tajuk Tesis *(Title of the Thesis)*	:	**Relationship Between Information Quality and Decision Effectiveness: A Study in the Banking Sector in Jordan**
Program Pengajian *(Programme of Study)*	:	**Doktor Falsafah (Ph.D)**
Nama Penyelia/Penyelia-penyelia *(Name of Supervisor/Supervisors)*	:	**Dr. Thi Lip Sam**



Tandatangan
(Signature)

PERMISSION TO USE

In presenting this thesis in fulfillment of the requirements for the degree of Doctor of Philosophy from Universiti Utara Malaysia, I agree that the Universiti Library may make it freely available for inspection. I further agree that permission for copying of this thesis in any manner, in whole or in part, for scholarly purposes may be granted by my supervisor or, in his absence, by the Dean of Centre for Graduate Studies. It is understood that any copying or publication or use of this thesis or parts thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to Universiti Utara Malaysia for any scholarly use which may be made of any material from my thesis.

Requests for permission to copy or to make other use of materials in this thesis, in whole or in part should be addressed to:

Dean of Centre for Graduate Studies
Universiti Utara Malaysia
06010 UUM Sintok
Kedah Darul Aman
Malaysia

ABSTRACT

This study was conducted to investigate the relationship between information quality and decision making. Specifically, the study aimed to determine the attributes of information quality needed for different types of decision, decision phases and the overall decision effectiveness in the banking sector.

To achieve this objective, several hypotheses were developed based on related theories and previous literature. In order to test these hypotheses, data was collected from bank managers who were the target population of this study. Quantitative approach using the mail questionnaire survey was conducted. A total of 249 usable questionnaires were received and subjected to factor analysis, test of differences, correlations and multiple regression to solicit answers for the research questions.

The overall findings for this study revealed there were significance differences in information quality attributes needed for decision making process between different types of decision, decision phases and types of bank. Furthermore, as predicted, the findings resulted from correlations and multiple regression revealed that information quality was positively associated with decision effectiveness. While the strength of this association differs based on different information quality attributes, types of decision, decision phases and types of bank.

This study had contributed in more than one aspect. Theoretically, the study contributes to the body knowledge by providing empirical evidence to support theories and previous literature related to information quality and decision making. Also, this study filled the gap in the literature by providing a theoretical framework assessing the attributes of information quality needed for different decision situations. Methodologically, the study contributes by providing a measurement scale for information quality attributes based on previous literature and used in this study.

Furthermore, factor analysis had identified new attributes with regards to information quality attributes which were subsequently adopted for different decision types namely tactical and strategic decision for the three different phases of decision makings namely intelligence, design and choice phase. As for Management implications, the findings for this study imply that more concerns should be taken by managers concerning information quality attributes due to its important roles in decision effectiveness. The differences between decision situations require the managers to choose the suitable information quality attributes based on the decision types, decision phases and types of bank whereby the decisions were undertaken.

AKNOWLEDGEMENT

First and most, I am grateful to Allah for providing me the power and inspirations needed for carrying out this study.

I would like to extend my appreciation to my supervisor, Dr. Thi Lip Sam, for his thorough supervision, encouragement, and willingness to support me throughout this study. To him, I would like to express my sincere gratitude for his enthusiasm and guidance. The completion of this study has been possible with his guidance.

Finally, I wish to dedicate this study to my family as they are always been my strongest supporters. I am indebted to all my family members for their love and appreciation during my study.

TABLE OF CONTENT

LIST OF APPENDICES

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

1.1 Background of Study

Decision making is a process of selecting the best alternatives between others (Even & Shakaranarayanan, 2007). Simon (1997) defined decision making as a process of selecting among alternate choices to achieve an objective. Mintzberg, Raisinghani & Theoret (1976) claimed that decision making can be incremental or sequential which consists of logical sequential steps or process.

In general decisions can be categorized into two types, namely tactical and strategic decisions. As tactical decisions are short term or daily decisions while strategic are long term decisions (Teale, Dispenza, Flynn & Currie, 2003). Regardless of its type, decision is a continuous process that comprise of different phases. Most researchers classified these into three major phases, namely intelligence, design and choice phase (Ehsani, Makui & Nezhad, 2010).

The managers are primarily decision-makers as managerial activities evolve around decision-making. Choo (2006) stresses on the importance of decision making when he highlightrd;

> *'Although organizational decision making is a complex and messy process, there is no doubt that it is a vital part of organizational life and all organizational actions are initiated by decisions and all decisions are commitments to action'.*

The contents of the thesis is for internal user only

REFERENCES

Adair, J. (1985). *Effective decision-making*. London: Pan.

Adelman, S. (2009).Yet another piece on data quality. *Enterprise Information Management Institute (EIMI)*, 3 (6), 1.

Aftab, O., Cheung, P., Kim, A., Thakkar, S., and Yeddanapudi, N. (2001). Information theory and the digital age. *Project Paper Cambridge, MA: Massachusetts Institute of Technology*.

Ahmad, A. and Zink, S. (1998). Information technology adoption in Jordanian public sector organizations. *Journal of Government Information*, 25 (2), 117-134.

Alexander, J. E. and Tate, M. A. (1999). *Web Wisdom: How to evaluate and create information quality on the Web*. New Jersey: Erlbaum.

Al-Gahtani Said S., Hubona Geoffrey S. and Wang Jijie. (2007). Information Technology (IT) in Saudi Arabia: Culture and the acceptance and use of IT. *Information & Management*, 44 (8), 681–691.

Almossawi, M. (2001). Bank selection criteria employed by college students in Bahrain: An empirical analysis. *International Journal of Bank Marketing*, 19 (3), 115-125.

Alwis, S. M. and Higgins, S. E. (2001). Information as a tool for management decision making: A case study of Singapore. *Information Research*, 7 (1), 1-37.

Armstrong, J. S. and Overton, T. A. (1982). *Estimating nonresponse bias in mail surveys in marketing research: Applications and problems*. In: Arun, K. J., Christian, P. and Ratchford, B. T. (eds.). Chichester: John Wiley.

Avgerou Chrisanthi, (2008). Information systems in developing countries: A critical research review. *Journal of Information Technology,* 23 (3), 133–146.

Baars, H. and Kemper, H. (2008). Management support with structured and unstructured data-An integrated business intelligence framework. *Information Systems Management*, 25 (2), 132–148.

Babbie, E. (2001). *The practice of social research* (9th ed.). Belmont, CA: Wadsworth Publishing.

Bacharach, N., Hasslen, R. C., and Anderson, J. (1995). *Learning together: A manual for multiage grouping*, CA: Corwin Press.

Bailey, J. E., and Pearson, S. W. (1983). Development of a tool for measuring and analyzing computer user satisfaction. *Management Science*, 29 (5), 530-545.

Bass, B. (1983). *Organizational decision making*. Homewood IL: Irwin.

Batini, C., Cappiello, C., Francalanci, C. and Maurino, A. (2009). Methodologies for data quality assessment and improvement. *ACM Computing Surveys*, 41 (3), 1-52.

Berg, N. (2005). Decision-making environments in which unboundedly rational decision makers choose to ignore relevant information. *Global Business and Economics Review*, 7 (1), 59-73.

Bouchet, M., Hopkins, T., Kinnell, M. and McKnight, C. (1998). Impact of information on decision making in pharmaceutical industry. *Library Management*, 19 (3), 196–206.

Bourgeois, L.J and Eisenhardt, K.M. (1988). Strategic decision process in high velocity environments: Four cases in the microcomputer industry. *Management Science*, 34 (7), 816-835.

Bovee, M. W. (2004). *Information quality: A conceptual framework and empirical validation.* Doctoral dissertation, University of Kansas.

Bovee, M., Srivastava, R. and Mak, B. (2001). A conceptual framework and belief-function approach to assessing overall information quality. In *Proceedings of the 6th International Conference on Information Quality*. Cambridge, pp. 311-328.

Brown, P. (2004). Bad data eats IT budgets. *Computer Weekly Newspaper*, 8/10/2004.

Cabrerizo, F., Alonso S. and Herrera-Viedma E. (2009). A consensus model for group decision making problems with unbalanced fuzzy linguistic information. *International Journal of Information Technology & Decision Making*, 8, (1) 109–131.

Cai, Y. (2007). *The impact of data quality metadata on decision-making*. Doctoral dissertation, Boston University.

Cappiello, C., Francalanci, C. and Pernici, B. (2004). Data quality assessment from the user's perspective. *In International Workshop on Information Quality in Information Systems (IQIS)*. Paris, ACM, 68-73.

Central Bank of Jordan (CBJ) (2005), Jordan. www.cbj.gov.jo.

Central Bank of Jordan (CBJ) (2007), Jordan. www.cbj.gov.jo.

Choo, C. W. (1993). *Acquisition and use of information by chief executive officers in the Canadian telecommunications industry*. Doctoral dissertation, University of Toronto.

Choo, C.W. (1996). The knowing organization: how organizations use information to construct meaning, create knowledge and make decisions. *International Journal of Information Management*, 16 (5), 329-340.

Choo, C.W. (2006). *The knowing organization how organizations use information to construct meaning, create knowledge, and make decisions (2nd ed.)*. New York: Oxford University Press.

Clickeman, P. M. (1999). Improving information quality. *Internal Auditor*, 56 (3), 32-33.

Cong, G., Fan, W., Geerts, F., Jia, X. and Ma, S. (2007). Improving data quality: consistency and accuracy. *The International Journal on Very Large Data Bases, September*, 23-28.

Cooper, R. B. (1983). Decision production - a step toward a theory of managerial information requirements. *Proceedings of the Fourth International Conference on Information Systems*, Houston, 215-268.

Cooper, D. R. and Schindler, P. S. (2003). *Business Research Methods (8th ed.)*. New York: Mc Graw Hill.

Cowie, J. and Burstein, F. (2007). Quality of data model for supporting mobile decision making. *Decision Support Systems*, 43 (4), 1675–1683.

Crowther, D. and Lancaster, G. (2009). *Research methods: A concise introduction to research in management and business consultancy (2nd ed.)*. Oxford: Elsevier.

Cyert, R. M. and March, J. G. (1992). *A behavioral theory of the firm*. Oxford: Blackwell Publishers.

Daft, R. L. and Lengel, R. H. (1986). Organizational information requirements, media richness and structural design. *Management Science*, 32 (5), 554-571.

Darlington, M. J., Culley, S. J., Zhao, Y., Austin, S. A., and Tang, L.C.M., (2009). Defining a framework for the evaluation of information. *International Journal of Information Quality*, 2 (2), 115-132.

Davis, D. (1996). *Business research for decision making (4th ed.)*. California: Wadsworth Publishing Company.

Dean, J.W., and Sharfman, M.P. (1996). Does decision process matter? A study of strategic decision making effectiveness. *Academy of Management Journal*, 39 (2), 368-396.

Dedeke, A. (2000). A conceptual framework for developing quality measures for information systems. *Proceedings of 5th International Conference on Information Quality*, Cambridge, 126-128.

Deloitte Consulting LLP, (2006). Information Quality (IQ) matters: Enhancing IQ can help to improve the management of performance, risk & compliance. *www.businessweek.com*

DeLone, W. H. and McLean, E. R. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems*, 19 (4), 9-30.

Deming, E. (1986). *Out of crisis*. Cambridge: MIT Center.

DeShon, R., and Landis, R. S. (1997). The dimensionality of the Hollenbeck, Williams, and Klein (1989) measure of goal commitment on complex tasks. *Organizational Behavior and Human Decision Processes,* 70 (2), 105–116.

Devanur, R. and Fortnow L. (2009). A computational theory of awareness and decision making. *Proceedings of the 12th Conference on Theoretical Aspects of Rationality and Knowledge (TARK)*, California, 99-107.

Dizard, J. (2004). The implosion of Chalabi's Petra Bank. *Salon Media Group, May, 4.* Inc, Washington.

Drucker, P.F. (1967). The effective decision. *Harvard Business Review*, 45 (1), 92-98.

Drucker, P. F. (1985). *Management*. New York: Harper.

Drummond, H. (1991). *Effective decision making*. London: Kogan Page Limited.

Edwards, W. (1954). The theory of decision making. *Psychological Bulletin,* 51 (4), 380-417.

Ehsani, M. , Makui, A. , and Nezhad, S. (2010). A methodology for analyzing decision networks, based on information theory. *European Journal of Operational Research*, 202 (3), 853–863.

Eisenhardt, K.M. and Zbaraki, M. J. (1992). Strategic decision making. *Strategic Management Journal,* 13 (8), 17-37.

English, L. P. (1999). *Improving data warehouse and business information quality: Methods for reducing costs and increasing profits*. New York: Wiley.

English, L. P. (2000). The information quality revolution: Will America be left out again. *Information Impact International, Inc,* February.

English, L. P. (2003). How to save $567,925,000 through IQ management. *Information Impact International, Inc,* June.

English, L. P. (2005). IQ and "Muda:" Information quality as eliminating waste. *Information Impact International, Inc,* September.

Eppler, M. (2006). *Managing information quality: Increasing the value of information in knowledge-intensive products and process*. Berlin: Springer-Verlag.

Eppler, M. and Muenzenmayer, P. (2002). Measuring information quality in the Web context: A survey of state of the art instruments and an application methodology. *Proceedings of 7th International Conference on Information Quality*, Cambridge, 187-196.

Etezadi-Amoli, J. and Farhoomand, A. F. (1996). A structural model of end user computing satisfaction and user performance. *Information & Management*, 30 (2), 65-73.

Even, A., and Shankaranarayanan, G. (2007). Utility-driven assessment of data quality. *The Database for Advances in Information Systems,* 38 (2), 75-93.

Field, A. (2003). *Discovering statistics using SPSS for windows (3rd ed.)*. London: SAGE, Publications Ltd.

Fisher, C.W. (1999). *An empirically based exploration of the interaction of time constraints and experience levels on the data quality information (DQI) factor in decision-making.* Doctoral dissertation, University at Albany, State University of New York.

Fisher, C.W. Chengular-Smith, I. and Ballou, D.P. (2003). The impact of experience and time on the use of data quality information in decision-making. *Information Systems Research,* 14 (2), 170-188.

Fisher, C. W., and Kingma, B. R. (2001). Criticality of data quality as exemplified in two disasters. *Information and Management*, 39 (2), 109-116.

Ford, C.M. and Gioia, D. A. (2000). Factors influencing creativity in the domain of managerial decision making. *Journal of Management*, 26 (4), 705-732.

Forslund, H. (2007). Measuring information quality in the order fulfillment process. *International Journal of Quality and Reliability Management*, 24 (5), 515-524.

Forza, C. (1995). Quality information systems and quality management: A reference model and associated measures for empirical research. *Industrial Management and Data Systems*, 95 (2), 6-14.

Fox, R. (2004). Moving from data to information. *International Digital Library Perspectives*, 20 (3), 96-101.

Gabbard, C. B. and Park, G. S. (1996). *The information revolution in the Arab World: Commercial, cultural and political dimensions.* California: Rand Corp.

Gay, L. R., and Airasian,P. (2003). *Educational research: Competencies for analysis and applications (6th ed.)*. New Jersey: Merrill Prentice Hall.

Gay, L. R. and Diehl, P. L. (1992). *Research methods for business and management.* New York:Macmillan Publishing Company.

Gay, L. R. and Diehl, P. L. (1996). *Research methods for business and management.* New Jersey: Prentice Hall International, Inc.

Gino, F. (2004). The hidden cost of buying information. *Harvard Business School Working Knowledge Pub.* Nov. 8.

Graefe, G. and Werner, L. (2004). Context-based information retrieval for improved information quality in decision-making processes. *Proceedings of the 4th International Conference on Knowledge Management, Graz*: 2, 379-387.

Grieves, M. (1998). The impact of information use on decision making: studies in five sectors-introduction, summary and conclusions. *Library Management*, 19 (2), 78-85.

Gupta, U. and Collins, W. (1997). The impact of information systems on the efficiency of banks: An empirical investigation. *Industrial Management and Data Systems*, 97 (1), 10–16.

Hair, J. F., Black, W. C., Babin, B. J. and Anderson, R. E. (2006). *Multivariate data analysis (5th ed.)*. New Jersey: Pearson Prentice.

Hair, J., Money, A., Page, M., and Samouel, P. (2007). *Research methods for business.* New York: John Wiley & Sons, Ltd.

Hair, J., Samouel, P., Babin, B., and Money, A. (2003). *Essentials of business research methods.* New York: John Wiley & Sons Inc.

Harrison, E. F. (1987). *The managerial decision-making process*. Boston: Houghton Mifflin Company.

Harrison, E.F. and Pelletier, M. A. (1998). Foundations of strategic decision effectiveness. *Management Decision*, 36 (3), 147-159.

Hayashi, Y., Mouashe, Y. and Thomas, W. (2003). Analysis of investment opportunities in Jordan's financial services sector. *Student Research Working Paper Series*. Center for Information Technology and the Global Economy (CITGE).

Hedelin, L. and Allwood, C.M (2002). IT and strategic decision making. *Industrial Management and Data Systems*, 102 (3), 125 – 139.

Higgins, M. (1999). Meta-information and time: Factors in human decision making. *Journal of the American Society for Information Science*, 50 (2), 132-139.

Hoch, S. and Kurreuther, H. (2001). *Warton on making decisions*. New York: John Wiley.

Hollenbeck, J. R., Williams, C. L., and Klein, H. J. (1989). An empirical examination of the antecedents of commitment to difficult goals. *Journal of Applied Psychology,* 74 (1) 18–23.

Huner M., Ofner M. and Otto B. (2009). Towards a maturity model for corporate data quality management. *SAC '09: Proceedings of the 2009 ACM symposium on Applied Computing*, Honolulu, 231-238.

Hung Patrick and Low Graham Cedric. (2008). Factors affecting the buy vs build decision in large Australian organizations. *Journal of Information Technology*, 23 (2), 118-131.

Idrees, M. S. (1999). *The bureaucratic decision making quality and the use of new technology in Saudi Arabia*. Doctoral dissertation, University of Mississippi.

International Finance Corporation (IFC), 2008. www.ifc.org

Ivancevich J., Konopaske R., and Matteson M. (2008). *Organization behavior and management*. Boston: McGraw-Hill.

Ives, B., Olson, M., and Baroudi, J. (1983). The measurement of user information satisfaction. *Communications of the ACM*, 26 (10) 785-793.

James, A. S. (1998). *Information technology in business*. New Jersey: Prentice Hall.

Jarke, M., Lenzerini, M., Vassiliou, Y. and Vassiliadis, P. (1995). *Fundamentals of data warehouses*. New York: Springer Verlag.

Jennings, M. (2007). Strategies for business intelligence on the internet. *Enterprise Information Management Institute*, 1 (10), 1.

Johnson, B. (2009). The forgotten key. *Enterprise Information Management Institute,* 3 (5), 1.

Johnson, R. A., and Wichern, D. W. (2007). *Applied multivariate statistical analysis (6th ed.).* NJ: Pearson Education International.

Jokinen, H., and Ritala, R. (2009). Value of measurement information: A simple case study on grade change decisions. *Measurement*, 43 (1), 122-134.

Jonas, E., Traut-Mattausch, E., Frey, D. and Greenberg J. (2008). The path or the goal? decision vs. information focus in biased information seeking after preliminary decisions. *Journal of Experimental Social Psychology,* 44 (4), 1180–1186.

Jung, W. (2004). A review of research: An investigation of the impact of data quality on decision performance. *International Symposium on Information and Communication Technologies, 90, Las Vegas, Nevada.*

Juran, J. M. (1988). *Juran on planning for quality.* New York: The Free Press.

Kahn, B. K., Strong, D. M., and Wang, R. Y. (2002). Information quality benchmarks: Product and service performance. *Communications of the ACM*, 45 (4), 184-192.

Kaiesr, H. F. (1974). An index of factorial simplicity. *Psychometrika,* 39 (1), 31-36.

Katerattanakul, P. and Siau, K. (1999). Measuring information quality of Web sites: Development of an instrument. Preceeding of the 20th *International Conference on Information Systems. Charlotte, Atlanta: Association of Information Systems*, 279-285.

Kaye, D. (1995). The importance of information. *Library Management*, 16 (5), 6-15.

Keller, K. and Staelin, R. (1989). Assessing biases in measuring decision effectiveness and information overload. *Journal of Consumer Research*, 15 (4) 504-508.

Kelly, J. and Gennard, J. (2007). Business strategic decision making: The role and influence of directors. *Human Resource Management Journal*, 17 (2), 99–117.

Kerlinger, F. N. (1986). *Foundation of behavioral research, (3rd ed.)* New York: Holt, Rinehart and Winston.

Klein, B. D. (1998). User detection of errors in data: learning through direct and indirect experience. *Paper presented at Americas Conference on Information systems,* California.

Klein, B. D. (2001). User perceptions of data quality: Internet and traditional text sources. *The Journal of Computer Information Systems*; 41 (4), 9–18.

Klein, B. D. (2002). When do users detect information quality problems on the world wide?. *Proceeding of the 8th Americas Conference on Information Systems, Texas.*

Klein, H. J., Wesson, M. J., Hollenbeck, J. R., Wright, P. M. and DeShon, R. P. (2001). The assessment of goal commitment: A measurement model meta-analysis. *Organizational Behavior and Human Decision Processes*, 85 (1), 32–55.

Kleinmuntz, D. N. and Schkade, D. A. (1993). Information displays and decision process. *American Psychological Society*, 4 (4), 221-227.

Knight, S. and Burn, J. (2005). Developing a framework for assessing information quality on the world wide web. *Informing Science Journal*, 8 (5), 159-172.

Kownatzki, M. (2002). *The speed of strategic decision-making and the impact of corporate involvement at the SBU-level*. Doctoral dissertation, University of St. Gallen.

Kumar, R. (2005). *Research methodology*. London: SAGE Publications.

Lambert, D.M and Harrington, T. C. (1990). Measuring non response bias in customer service mail surveys. *Journal of Business Logistics*, 11 (2), 5-25.

Lee, S. J. (2007). *The role of information quality and market turbulence on CVB'S internet-based marketing information use*. Doctoral dissertation, University of Nevada.

Lee, Y. W., Strong, D. M., Kahn, B. K., and Wang, R. W. (2002). AIMQ: A methodology for information quality assessment. *Information & Management*, 40 (2), 133–146.

Lee, Y. W. and Strong, D. M. (2003). Knowing-Why about data processes and data quality. *Journal of Management Information Systems,* 20 (3), 13–39.

Leedy, D. and Ormrod, E. (2001). *Practical research design (7th ed.)* New Jersey: Merrill Prentice Hall.

Leidner, D. E. and Elam, J. J. (1995). The impact of executive information systems on organizational design, intelligence, and decision making. *Organization Science*, 6 (6), 645-665.

Leon, A. and Leon, M. (1999). *Fundamentals of information technology*. New Delhi: Vikas House.

Letzring, T. D., Wells, S. M. and Funder, D. C. (2006). Information quantity and quality affect the realistic accuracy of personality judgment. *Journal of Personality and Social Psychology*, 91 (1), 111–123.

Leung, H. K. N. (2001). Quality metrics for intranet applications. *Information and Management* , 38 (3), 137-152.

Levini, I., Huneke, M., and Jasper, J. (2000). Information processing at successive stages of decision making: Need for cognition and inclusion–exclusion effects. *Organizational Behavior and Human Decision Processes*, 82 (2), 171–193.

Lewis, P.J. (1991). The decision making basis for information systems: Contribution of Vicker's concept of appreciation perspective. *European Journal of Information Systems,* 1 (1), 33-43.

Li, Y. (2006). *Development of a knowledge-based theory of information and its application in computer-aided decision-making.* Doctoral dissertation, University of South Carolina.

Lilien L., Rangaswamy A., Van Bruggen G. and Starke, K. (2004). DSS effectiveness in marketing resource allocation decisions. *Information Systems Research,* 15 (3), 216–235.

Lillrank, P. (2003). The quality of information. *International Journal of Quality and Reliability Management*, 20 (6), 691-703.

Liu, Z. and Huang, X. (2005). Evaluating the credibility of scholarly information on the web: A cross cultural study. *The International Information and Library Review*, 37 (2), 99-106.

Los Angles Times, 4/8/1988. www.latimes.com

Low, G. and Mohr, J. (2001). Factors affecting the use of information in the evaluation of marketing communications productivity. *Journal of Academy of Marketing Science*, 29 (1), 70-88.

Lurie, H. and Swaminathan, M. (2009). Is timely information always better? The effect of feedback frequency on decision making. *Organizational Behavior and Human Decision Processes*, 108 (2), 315–329.

Luthans, F. (2008). *Organizational behavior*. New York: McGraw-Hill.

Madnick, S. E., Wang, R. Y., Lee, Y. W. and Zhu, H. (2009). Overview and framework for data and information quality research. *ACM Journal of Data and Information Quality*,1 (1), 1-22.

Mahmood, R. (2000a). An empirical investigation of the lending decisions on small businesses by bank managers in Malaysia, Doctoral dissertation, University of Glasgow.

Mahmood, R. (2000b). Influence of heuristics in bank managers' lending decisions to small business. Banker's Journal Malaysia, (116), 4th Quarter, 34-37.

Maier, N. R. F. (1963). *Problem-solving discussions and conferences*. New York: McGraw-Hill.

March, J. G. (2002). *The economics of choice, change and organizations*. Cheltenham: Edward Elgar Publishing Limited.

March, C. and Simon, H. (1958). *Organizations*. New York: John Wiley & Sons Inc.

Marco, D. (2008). Managing meta data for the business: knowledge management and regulatory requirements. *Enterprise Information Management Institute*, 1 (12), 1.

Marsden, J. R., Pakath, R. and Wibowo, K. (2006). Decision making under time pressure with different information sources and performance-based financial incentives. *Decision Support Systems,* 42 (1), 186– 203.

Martinsons, G. and Davison, M. (2007). Strategic decision making and support systems: Comparing American, Japanese and Chinese management. *Decision Support Systems*, 43 (1) 284–300.

Massaki, I. (1997). *Gemba Kaizen*. New York: McGraw-Hill.

Mentis, M., Bach, M., Hoffman, B., Rosson, B. and Carroll, M. (2009). Development of decision rationale in complex group decision making. *CHI '09: Proceedings of the 27th International Conference on Human Factors in Computing Systems,* Boston.

Metawa, S. A. (1998). Banking behavior of Islamic bank customers: Perspectives and implications. *International Journal of Bank Marketing,* 16 (7), 299–313.

Michaud, S. (2002). *The influence of information processing style on decision making effectiveness.* Doctoral dissertation, University of Arkon.

Michnik, J. and Lo, M. (2009). The assessment of the information quality with the aid of multiple criteria analysis. *European Journal of Operational Research*, 195 (3), 850–856.

Miller, H. (2005). Information quality and market share in electronic commerce. *Journal of Service Marketing*, 19 (2), 93-102.

Miner, J. B. (2002). *Organizational behavior foundations, theories, and analyses*. New York: Oxford University Press.

Ministry of Information and Communication (MOICT) Report, (2004), Jordan. www.moict.gov.jo

Mintzberg, H. (1973). *The nature of managerial work.* New York: Harper & Row.

Mintzberg, H., Raisinghani, D. and Théorêt, A. (1976). The structure of "unstructured" decision processes. *Administrative Science Quarterly*, 21 (2), 246 – 275.

Mintezberg, H. (1979). *The structuring of organizations*. New Jersey: Prentice-Hall.

Mintzberg, H. (1989). *On management: Inside our strange world of organizations*. New York: Free Press.

Molloy, S. and Schwenk R. (1995). The effects of information technology on strategic decision making. *Journal of Management Studies,* 32 (3), 283-311.

Morris, S., Med, J. and Svendsen, N. (1996). *The intelligent manager: Adding value in the information age*. London: Pitman.

Moss, L. (2009). Managing unstructured data. *Enterprise Information Management Institute*, 3 (9), 1.

Mullins, L. (2006). *Essentials of organizational behavior*. New Jersey: Prentice Hall.

Naisbitt, J. and Aburdene, P. (1985). *Re-inventing the corporation transforming your job and your company for the new information society*. New York: Warner Books.

Najjar, L. (2002). *The impact of information quality and ergonomics on service quality in the banking industry.* Doctoral dissertation, University of Nebraska.

Naseer, Y. (1987). Status and capabilities of management information systems in Jordan. *Royal Scientific Society Newsletter,* 15 (August), 3–6 [in Arabic].

Naser, K., Jamal, A. and Al-Khatib, K. (1999). Islamic banking: A study of customer satisfaction and preferences in Jordan. *International Journal of Bank Marketing*, 17 (3), 135-150.

National Information Center (1995). Jordan's information policies and strategies preparing jordan for the 21st century. August.

Naumann, F. (2002). Quality-driven query answering for integrated information systems. *Lecture Notes in Computer Science,* 2261.

Naumann, F. and Rolker, C. (2000). Assessment methods for the information quality criteria. *Proceedings of the 5th International Conference on Information Quality,* 148-162.

Ni, J. and Khazanchi, D. (2009). Information technology investment decisions under asymmetric information: A modified rational expectation model. *International Journal of Information Technology and Decision Making*, 8 (1), 55–72.

Nicolas, R. (2004). Knowledge management impacts on decision making process. *Journal of Knowledge Management*, 8 (1), 20-31.

Nino, M. (2001). The impact of information system on decision making: Study on the housing bank branches in the north of Jordan. *Irbid Journal of Scientific and Research*, 4 (1), 1-23.

Nusseir, Y. (1995). Jordan's national information system. *Proceedings of the Annual Conference of the Internet Society INET '95 Conference*, Honolulu, Hawaii.

Nutt, C. (2007). Intelligence gathering for decision making. *Omega,* 35 (5), 604-622.

O'Reilly, C. A. (1982). Variations in decision makers' use of information sources: The impact of quality and accessibility of information. *Academy of Management Journal*, 25 (4), 756-771.

Outland, E. H. (2004). *Critical roles of information overload, information quality, and perceived information distortion on organizational effectiveness: A customer relationship management perspective.* Doctoral dissertation, Georgia State University.

Pallant Julie, (2007). *SPSS survival manual (3^{rd} ed.)*. New York: McGraw Hill.

Parker, M. B., Moleshe, V., De la Harpe, R. and Wills, G. B. (2006). An evaluation of information quality frameworks for the World Wide Web. *In: 8^{th} Annual Conference on WWW Applications, 6-8^{th} September,* Bloemfontein: Free State Province.

Paul, S., Saunders, C., and Haseman, W. (2005). A question of timing: The impact of information acquisition on group decision making. *Information Resources Management Journal,* 18 (4), 81-100.

Pipino, L. L., Lee, Y. W. and Wang, R. Y. (2002). Data quality assessment. *Communications of the ACM*, 45 (4), 211-218.

Porter, M.E. and Millar, V.E. (1985). How information gives competitive advantage. *Harvard Business Review*, 63 (4), 110-18.

Poston, R., Reynolds, R. and Gillenson, M. (2007).Technology solutions for data accuracy and availability problems in healthcare records. *Information Systems Management*, 24 (1), 59-71.

Power, J. (2008). Understanding data-driven decision support systems. *Information Systems Management*, 25 (2), 149-154.

Price, R. and Shanks, G. (2005). A semiotic information quality framework: Development and comparative analysis. *Journal of Information Technology*, 20 (2), 88-102.

Raghunathan, S. (2000). Impact of information quality and decision-maker quality on decision quality: A theoretical model and simulation analysis. *Decision Support Systems,* 26 (4), 275-286.

Rajagopalan, N., Rasheed. A. and Datta, D. (1993). Strategic decision processes: Critical review and future directions. *Journal of Management,* 19 (2), 349- 384.
Redman, T. C. (2004). Data: An unfolding quality disaster. *Information Management. Magazine*, 57, 22-23.

Reid, C., Thomson, J. and Smith, J. (1998). Impact of information on corporate decision making: The UK banking sector. *Library Management*, 19 (2), 86-109.

Rieh, S. Y. (2002). Judgment of information quality and cognitive authority in the web. *Journal of American Society for Information Science and Technology*, 53 (2), 145-161.

Saunders, M., Lewis, P. and Thornhill, A. (2007). *Research methods for business students (4th ed.)*. London: Prentice Hall.

Schweiger, D. M. and Sandberg, W. (1989). The utilization of individual capabilities in group approaches to strategic decision making. *Strategic Management Journal*, 10 (1), 31-43.

Schweiger, D. M., Sandberg, W. R. and Rechner, P. L. (1989). Experiential effects of dialectical enquiry, devil's advocacy and consensus approaches to strategic decision making. *Academy of Management Journal,* 32 (4), 745-772.

Scannapieco, M. (2004). *Da Quin CIS: exchanging and improving data quality in cooperative information systems.* Doctoral dissertation, University of La Sapienza, Roma.

Sekaran, U. (2003). *Research methods for business (4th ed.)*. New Jersey: John Wiley & Sons, Inc.

Shankaranarayanan, G. and Cai, Y. (2006). Supporting data quality management in decision-making. *Decision Support Systems*, 42 (1), 302-317.

Shanks, G. and Corrbitt, B. (1999). Understanding data quality: Social and cultural aspects. *Proceedings of the 10th Australian Conference on Information Systems*, Victoria University of Wellington, 785-797.

Simon, H. A. (1957). *Models of man: social and rational.* New York: John Wiley.

Simon, H. A. (1977). *The new science of management decision.* New Jersey: Prentice-Hall.

Simon, H. A. (1986). Rationality in psychology and economics. *Journal of Business,* 59 (4), 209-224.

Simon H. A. (1997). *Administrative beh*avior. New York: Free press.

Simons, R. H. and Thompson, B. M. (1998). Strategic determinants: the context of managerial decision making. *Journal of Managerial Psychology*, 13 (1/2), 7-21.

Slone J. P. (2006). *Information quality strategy: an empirical investigation of the relationship between information quality improvements and organizational outcomes.* Doctoral dissertation, Capella University, Minnesota.

Smith, A. (2008). Enterprise data modeling. *Enterprise Information Management Institute*, 2 (2), 1.

Smith, C., Winterman, V. and Abell, A. (1998). The impact of information on corporate decision making in the insurance sector. *Library Management*, 19 (3), 154-173.

Soliman, F. and Youssef, M. (2003). The role of critical information in enterprise knowledge management. *Industrial Management & Data Systems*, 103 (7), 484-490.

Speier, C. and Morris, M. (2003). The influence of query interface design on decision-making performance. *MIS Quarterly*, 27 (3), 397-423.

Stevens,J. (1996). *Applied multivariate statistics for the social science (3rd ed.)*. Mahwah, New Jersey: Lawrence Erlbaum.

Strong, D., Lee, Y. and Wang, R. (1997). Data quality in context. *Communications of the ACM*, 40 (5), 103-110.

Stvilia, B. (2006). *Measuring information quality.* Doctoral Dissertation, University of Illinois at Urbana-Champaign.

Swartz, N. (2007). E-discovery expectations. *Information Management Journal Lenexa*, 41 (3), 11.

Tabachnick, B. G., and Fidell, L. S. (2007). *Using multivariate statistics (5th ed.)*. Boston: Allyn and Bacon.

Tabatabaei, M. (2007). An effectiveness analysis of information channeling in choice decision making with attribute importance weights. *Computers in Human Behavior*, 23 (1), 564–577.

Tahir, S. (2007). Islamic banking theory and practice: a survey and bibliography of the 1995-2005 literature. *Journal of Economic Cooperation*, 28 (1) 1-72.

Tarter, J. and Wayne, H. (1998). Toward a contingency theory of decision making. *Journal of Educational Administration*, 36 (3), 212-228.

Tayi, G. K. and Ballou, D. P. (1998). Examining data quality. *Communications of the ACM*, 41 (2), 54–57.

Teale, M., Dispenza,V., Flynn, J. and Currie,D. (2003). *Management decision making*. London: Prentice Hall.
Teng, J. T. and Calhoun, K. J. (1996). Organizational computing as a facilitator of operational and managerial decision making: An exploratory study of managers' perceptions. *Decision Sciences*, 27 (4), 673-710.

Teo, T. S. and Wong, P. K. (1998). An empirical study of performance impact of computerization in the retail industry. *Omega*, 26 (5), 611-621.

Thyer, B. A. (1993). *Single-systems research design" in R.M. grinnell (ed.), social work, research and evaluation (4th ed.)*. Itasca Illinois: F.E. Peacock Publishers.

Tsai, I., Klayman, J. and Hastie, R. (2008). Effects of amount of information on judgment accuracy and confidence. *Organizational Behavior and Human Decision Processes*, 107 (2) 97–105.

Turban, E., Rainer, R. and Potter, R. (2003). *Introduction to information technology*. New York: John Wiley and Sons. Inc.

Turban, E., Aronson, J., and Liang, T. (2005). *Decision support systems and intelligent systems*. New Jersey: Person Prentice Hall.

Uotila, T. and Melkas, H. (2007). Quality of data, information and knowledge in regional foresight processes. *Futures*, 39 (9), 1117-1130.

Utkin, L.V. and Augustin, Th. (2007). Decision making under incomplete data using the imprecise Dirichlet model. *International Journal of Approximate Reasoning*, 44 (3), 322–338.

Vroom, V. H. and Yatton, P. W. (1973). *Leadership and decision making*. Pittsburgh: University of Pittsburgh Press.

Wainright, E. (2005). *Managing information technology*. New Jersey: Pearson Education International.

Wand, Y. and Wang, R. (1996). Anchoring data quality dimensions in ontological foundations. *Communications of the ACM*, 39 (11), 86–95.

Wang, Z. (1994). Organizational decision making and competence utilization among Chinese managers. *Journal of Managerial Psychology*, 9 (7), 17-24.

Wang, R. Y., Storey, V. C., and Firth, C. P. (1995). A framework for analysis of data quality research. *IEEE Transactions on Knowledge and Data Engineering*, 7 (4), 623-640.

Wang, R.Y. and Strong, D.M. (1996). Beyond accuracy: What data quality means to data consumers. *Journal of Management Information Systems*, 12 (4), 5-33.

Watts, S., Shankaranarayanan, G. and Even, A. (2009). Data quality assessment in context: a cognitive perspective. *Decision Support Systems,* 48 (1), 202-211.

Welch, D. A. (2002). *Decisions, decision:.The art of effective decision making.* New York: Prometheus.

Williams, M., Dennis, A., Stam, A. and Aronson, J. (2007). The Impact of DSS use and information load on errors and decision quality. *European Journal of Operational Research*, 176 (1), 468–481.

Winterman, V., Smith, C. and Abell, A. (1998). Impact of information on decision making in government departments. *Library Management*, 19 (2), 110-132.

Witte, E. (1972). Field research on complex decision-making processes - the phase theorem. *International Studies of Management and Organization*, 2 (2), 156-182.

Wixom, H. and Watson, J. (2001). An empirical investigation of the factors affecting data warehousing success. *MIS Quarterly*, 25 (1), 17-41.

World fact book, (2008). Central Intelligence Agency. www.cia.gov

Zaharuddin, A. (2007). Differences between Islamic bank and conventional. 3 March 2007. www.mohdhafez.net.

Zeist, R. H. J. and Hendriks, P. R. H. (1996). Specifying software quality with the extended ISO model. *Soft Ware Quality Journal*, 5 (4), 273-284.

Zikmund, W. G. (2003). *Business research methods (7th ed.).* Ohio: South Western Educational Publishing.

Zhu, X. and Gauch, S. (2000). Incorporating quality metrics in centralized distributed information retrieval on the world wide web. *Proceeding of the 23rd Annual International ACM SIGIR Conference on Research and Development in Information Retrieval, Athens,* 288-295.