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UNIVERSITI UTARA MALAYSIA**

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**THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGY
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ABSTRAK

Perkembangan pesat Teknologi Maklumat dan Komunikasi (ICT) memaksa organisasi di seluruh dunia menitikberatkan peranan ICT dalam menyokong matlamat pemiagaan mereka. Kini organisasi pemiagaan di Malaysia telah pun menyedari penggunaan efektif ICT dapat menawarkan perjalanan operasi yang lebih terancang dan berdaya saing. Pada masa ini terdapat banyak penyelidikan dijalankan bagi menentukan penggunaan ICT dalam pembuatan keputusan. Sungguhpun begitu, kepentingan ICT dalam pembuatan keputusan masih belum membangun sepenuhnya khususnya di Malaysia. Penyelidikan ini menerangkan profil penggunaan ICT di kalangan 64 organisasi pemiagaan di seluruh Malaysia yang tersenarai di dalam Bursa Saham Kuala Lumpur (BSKL) 2002 dari beberapa aspek iaitu impak ICT dalam aktiviti syarikat, peranan ICT di dalam pembuatan keputusan, perkembangan aplikasi ICT dalam pembuatan keputusan, latihan ICT yang diperlukan, dan faktor-faktor yang berkaitan dengan aplikasi ICT di dalam sesebuah syarikat. Hasil daripada analisis yang dijalankan, didapati perkembangan ICT khususnya sektor swasta semakin pesat membangun. Penggunaan ICT di peringkat pengurus adalah lebih kurang 70 peratus sebulan. ICT juga dikenalpasti dapat membantu sesebuah syarikat membuat keputusan strategik berdasarkan faktor sokongan daripada pihak atasan, insentif daripada kerajaan, sokongan data, kerjasama dalam kumpulan dan format output yang mesra pengguna.

Kata kunci: Teknologi Maklumat dan Komunikasi (ICT), Pembuatan Keputusan, Sistem Sokongan Keputusan (DSS)

ABSTRACT

The rapid and pervasive growth of Information and Communication Technology (ICT) has forced organizations worldwide to consider the role of ICT in supporting their business goals. Malaysian business organizations now realize the effective use of ICT to support organized operation activities and the ability to compete. There have been many studies to determine the use of ICT in decision making. However, the importance of ICT in decision making is still not well established especially in Malaysia. This report describes the profile of ICT utilization among 64 business organizations listed in the Kuala Lumpur Stock Exchange (KLSE) 2002: the impacts of ICT on companies' activities, the perceived roles of ICT in decision making, the extent of ICT application in decision making, the relevant training needed, and also the factors associated with the applications of ICT in a company. This study reveals that the development of ICT especially in the private sector is rapidly growing. The monthly ICT usage among managerial personnel was around 70 percent. Support from top management, incentive from the government, data support, team working and friendly output format are the factors perceived to help promote the use of ICT in decision making among the respondents.

Keywords: Information and Communication Technology (ICT), Decision Making, Decision Support Systems (DSS)

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CHAPTER 1

INTRODUCTION TO THE STUDY

1.1 Introduction

This chapter presents the overall view of the study. The aim of this study was to determine the use of Information and Communication Technology (ICT) in decision making among the listed organizations in Malaysia. This chapter begins with a brief description of ICT in Malaysia, some theory about decision making, and ICT in decision making. It is then followed by the problem statement, objectives of the study, research questions, study design, assumptions and the significance of the study. Finally, the organization of the thesis is presented.

The contents of
the thesis is for
internal user
only

REFERENCES

- Abdul Halim Jusoh (2002). *Preparing students for ICT industry*. Computimes, New Straits Times Press. 11 November 2002.
- Adeoti-Adekeye, W.B. (1997). *The importance of management information systems*. Library Review, Vol. 46, No. 5, 318-327.
- Ahmad Khusairi, (2002). *ICT and Malaysia's future*. Business Computing, New Straits Times, 5th September 2002.
- Aiken, M., Hawley, D., & Zhang, W. (1994). *Increasing Meeting Efficiency with a GDSS*. *Industrial Management & Data Systems*, Vol. 94, No. 8, 13-16.
- Ang, C.L., Davies, M.A., & Finlay, P.N. (2001a). *An empirical model of IT usage in the Malaysian public sector*. *Journal of Strategic Information Systems*, 10, 159-174.
- Ang, C.L., Davies, M.A., & Finlay, P.N. (2001b). *An empirical study of the use of information technology to support total quality management*. *Total Quality Management*, Vol. 12, No. 2, 145-157.
- Ballantyne, P. (2002). *eDevelopment, eCooperation: connecting the worlds of information and development*. *Compare*, Vol. 32, No.3, 365-379.
- Beach, L. R. (1997). *The Psychology of Decision Making People in Organizations*, 1st Edn. Sage Publications, pp. 125.
- Bruggen, G.H.V., Smidts, A., & Wierenga, B. (2001). *The powerful triangle of marketing data, managerial judgement, and marketing management support systems*. *European Journal of Marketing*, Vol. 35, No. 7/8, 796-816.
- Bryman, A. (1996). *Quantity and Quality in Social Research, Contemporary Social Research*: 18. Routledge, pp. 31, 47.

- Buttery, A., & Tamaschke, R. (1995). *Marketing decision support systems in a small trading nation: An Australian case study*. Marketing Intelligence & Planning, Vol. 13, No. 2, 14-28.
- Cardinali, R. (1998). *Assessing technological productivity gains: Benson and Parker revisited*. Logistics Information Management, Vol. 11, No. 2, 89-92.
- Chow, W.S. (2001). *Ethical belief and behavior of managers using information technology for decision making in Hong Kong*. Journal of Managerial Psychology, Vol. 16, No. 4, 258-267.
- Coakes, S. J., & Steed, L. G. (2001). *SPSS Analysis without Anguish, Version 10.0 for WINDOWS*. John Wiley & Sons Australia, Ltd.
- Crowston, K., Sawyer, S., & Wigand, R. (2001). *Investing the interplay between structure and information and communication technology in the real estate industry*. Information Technology & People, Vol. 14, No. 2, 163-183.
- Dasgupta, S., Sarkis, J., & Talluri, S. (1999). *Influence of information technology investment on firm productivity: a cross-sectional study*. Logistic Information Management, Vol. 12, No. 1/2, 120-129.
- Dawson, R. (1993). *Make the Right Decision Every Time, How to make the right business and personal decision confidently*, 2nd Edn. Nicholas Brealey Publishing London, pp. 13, 249,250.
- Donelly, M., Dalrymple, J.F., & Hollingsworth, I.P. (1994). *The use and development of information systems and technology in Scottish Local Government*. International Journal of Public Sector Management, Vol. 7, No. 3, 4-15.
- Drummond, H. (1991). *Effective Decision Making*, 1st Edn. Kogan Page, pp. 110.

- Eight Malaysia Plan (2001-2005). Percetakan Nasional Malaysia Berhad (Released on 23/4/2001).
- Emory, C.W., & Cooper, D.R. (1991). *Business Research Method*, 4th Edn. IRWIN, pp. 332-339.
- Fairol Halim (2001). *The Effect of It on Marketing Performances The Case of Malaysian Companies*. Universiti Putra Malaysia.
- Feraud, G.J.S. (1998). *Research paper: improving strategic decision making in logistics information management – a framework*. Logistics Information Management, Vol. 11, No. 4, 232-243.
- Gilmore, A. (1998). *Quality in management decision making within a changing context*. Journal of Management Development, Vol. 17, No. 2, 106-120.
- Gray, P.H. (2001). *The impact of knowledge repositories on power and control in the workplace*. Information Technology & People, Vol. 14, No. 4, 368-384.
- Gummesson, E. (1991). *Qualitative Methods in Management Research*, 1st Edn. Sage Publications, pp. 162.
- Haag, S., Cummings, M., & Dawkins J. (1998). *Management Information Systems for the Information Age*, 1st Edn. Irwin McGraw-Hill, pp. 165.
- Hair, J.F.J.R., Anderson, R.E., Tatham, R.L., & Black, W.C. (1992). *Multivariate Data Analysis with Readings*, 3rd Edn. Macmillan Publishing Company, pp. 223-251.
- Harrison, E.F. (1996). *A process perspective on strategic decision making*. Management Decision, Vol. 34, No. 1, 46-53.
- Hedelin, L., & Allwood, C.M. (2002). *IT and strategic decision making*. Industrial Management & Data Systems, Vol. 102, No. 3, 125-139.

- Hogbin, G., & Thomas, D.V. (1994). *Investing in Information Technology, Managing the Decision –making Process*, 1st Edn. McGraw-Hill Book Company, pp. 121.
- Johannessen, J., Olaisen, J., & Olsen, B. (1999). *Strategic use of information technology for increased innovation and performance*. Information Management and Computer Security, Vol. 7, No. 1, 5-22.
- Keen, P.G.W. (1995). *Every manager's guide to information technology. A glossary of key terms and concepts for today's business leader*, 2nd Edn. Harvard Business School Press, pp. 8,9,30,133,181-183, 246-247, 267-273.
- Kim, J-O., & Mueller, C.W. (1978). *Factor Analysis Statistical Methods and Practical Issues*. SAGE Publications, pp. 27,38.
- Laver, M. (1989). *Information Technology: agent of change*, 1st Ed. Cambridge University Press, pp. 30, 31.
- Liang, T.P., & Hung, S.Y. (1997). *DSS and EIS applications in Taiwan*. Information Technology & People, Vol. 10, No. 4, 303-315.
- Maclean, D., Souter, D., Deane, J., & Lilley, S. (2002). *Strengthening Developing Country Participation in International ICT Decision Making*. Louder Voices, pp. 1-28.
- Mallach, E.G. (2000). *Decision Support and Data Warehouse Systems*. McGraw-Hill International Editions.
- Marco, M.D., Sorrentino, M., & Carignani, A. (1999). *Push technology supporting IS IT management decisions*. Logistics Information Management, Vol. 12, No. 1/2, 182-188.
- May, T.A. (1997). *The death of ROI: re-thinking IT value management*. Information Management & Computer Security, Vol. 5, No. 3, 90-92.

- Mescon, M.H., Bovee', C.L., & Thill, J. V. (2002). *Business Today*, 10th Ed. Prentice Hall.
- Mok, M.. *Pooling best practices to woo MNCs*. Business Computing, New Straits Times, 5th September 2002.
- Moody, P.E. (1983). *Decision Making*, 1st Ed. McGraw Hill Book Company, pp. 51.
- Nath, V. (2000). *Heralding ICT enabled knowledge Societies , way forward for the developing countries*. knownet@knownetweaver.org.
- Neef, D. (1999). *Making the case for knowledge management: the bigger picture*. Management decision, Vol. 37, No. 1, 72-78.
- Nord, J.H., & Nord, G.D. (1995). *Why managers use executive support systems: selecting and using information technology for strategic advantage*. Industrial Management & Data Systems, Vol. 95, No. 9, 24-28.
- Othman Yeop Abdullah, Valida, A.C., Ang, C.L. and Norita Norwawi (1996). *A Profile of Malaysian Chief Executive Officers' Use of Information Technology to Support Decision Making*. 7th Australian Conference on Information Systems, 33-43.
- Pereira, R.E. (1999). *Factors influencing consumer perceptions of web-based decision support systems*. Logistics Information Management, Vol. 12, No. 1/2, 157-181.
- Peters, L. (2002). *Communication for Information Technology, New South Wales Department of Education and Training, Access Series*. Mc Graw Hill, pp. 4, 5, 92-101.
- Pinkerton, J. (1990). *Understanding Information Technology, Basic terminology and practice*, 1st. Ellis Horwood, pp. 89, 90.

- Purba, S., & Shah, B. (2002). *How to manage a successful software project*, 2nd Ed. Wiley Computer Publishing, pp.8-17, 36-38, 136-140.
- Quibria, M.G., Tschang, T., & Reyes-Macasaquit, M.L. (2002). *New Information and Communication Technology and Poverty*. Journal of the Asia Pasific Economy 7(3), 285-309.
- Yusri Sahat. *Penubuhan Unitem pastikan setiap rakyat miliki kelulusan tinggi*. Utusan Malaysia, 27th August 2002.
- Sambrook, S. (2001). *Factors influencing learners' perceptions of quality of computer based learning materials*. Journal of European Industrial Training, Vol. 25, No. 2/3/4, 157-167.
- Schroeder, L. D., Sjoquist, D. L., & Stephan P. E. (1986). *Understanding Regression Analysis An Introductory Guide, Series: Quantitative Applications in the Social Siences*. SAGE Publications, pp.29-32.
- Sekaran, U. (1992). *Instructor's Resource Guide with Test Questions and Transparency Masters, Research Methods for Business : A Skill Building Approach*, 2nd Ed. John Wiley and Sons.
- Sekaran, U. (2000). *Research Methods for Business : A Skill Building Approach*, 3rd Ed. John Wiley and Sons.
- Seventh Malaysia Plan (1996-2000). National Printing Department, Kuala Lumpur.
- Silva, F.N. (2001). *Providing spatial decision support for evacuation planning; a challenge in integrating technologies*. Disaster Prevention and Management, Vol. 10, No. 1, 11-20.
- Simon, H.A. (1997), *Administrative Behavior, A study of decision-making processes in administrative organizations*. 4th Ed. The Free Press.
- Sixth Malaysia Plan (1991-1995). National Printing Department, Kuala Lumpur.

- Slywotzky, A., & Morrison, D. (2001). *Becoming a digital business: - it's not about technology*. *Strategy and Leadership*, Vol. 29, No.2, 4-9.
- Sturges, P. (1999). *Social intelligence for developing countries: the role of grey literature*. *Collection Building*, Vol. 18, No. 3, 114-126.
- Turban, E., & Aronson, J.E. (2001). *DSS and Intelligent System (International Edition)*, 6th Ed. Prentice Hall.
- Turban, E., McLean, E., & Wetherbe, J. (2001). *Information Technology for Management, Making connections for strategic advantage*, 2nd Edn. John Wiley & Sons, Inc., pp. 62-63.
- Udo, G.G. (2000). *Using analytic hierarchy process to analyze the information technology outsourcing decision*. *Industrial Management & Data Systems*, Vol. 100, No. 9, 421-429.
- Valida, A.C., Ang, C.L., Mohd Kahairuddin Kasiran., Shahrums Hashim & Suradi Zurinah (1994). *A survey of information technology utilization among business organization in Malaysia*. *ICIT'94*, pp. 290-309.
- Wang, Z. M. (1994). *Organizational Decision Making and Competence Utilization among Chinese Managers*. *Journal Of Managerial Psychology*, Vol. 9, No. 7, 17-24.
- Wen, H.J., & Lin, B. (1998). *Internet and employee productivity*. *Management Decision*, Vol. 36, No. 6, 395-398.
- Whitten, N. (1990). *Managing Software Development Projects: formula for success*, 2nd Ed. John Wiley & Sons, Inc., pp. 279-293.
- Yu, P.L., & Chiang, C.I. (2002). *Decision making: habitual domains and information technology*. *International Journal of Information Technology & Decision Making*, Vol. 1, No. 1, 5-26.