INFORMATION SYSTEM EFFECTIVENESS IN PROJECT MANAGEMENT: A STUDY OF PROJECT MONITORING SYSTEM II AT THE MINISTRY OF AGRICULTURE AND AGRO-BASED INDUSTRY.

By

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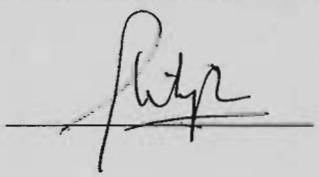

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ABSTRACT

In the context of public sector project management and monitoring in Malaysia, Project Monitoring System II (PMS II) is the primary Project Management Information System (PMIS) which is currently being used by all the ministries, departments and government agencies. Previous studies have suggested that the use of PMIS was considered to be advantageous towards successful project execution. Using the antecedents of system success as proposed by DeLone and McLean in the Updated Information System Success Model (ISSM), i.e. system quality, information quality and service quality, this study attempts to provide insight into the impacts of PMS II towards successful execution of public projects and ascertain the determinants that influence the system's effectiveness. The findings from this study showed that users at the ministry of Agriculture and Agro-Based Industry generally agreed that PMS II is an effective system to support project management and monitoring activities. The factors of system quality, information quality and service quality were found to have a significant relationship with the effectiveness of the system. Among these three factors, information quality was found to have the greatest effect of any variation in the effectiveness of PMS II.

Keywords: PMS II, system effectiveness, system quality, information quality and service quality.

ABSTRAK

Dalam konteks pengurusan dan pemantauan projek sektor awam di Malaysia, Sistem Pemantauan Projek II (SPP II) merupakan sistem maklumat pengurusan projek utama yang digunakan oleh semua kementerian, jabatan dan agensi kerajaan. Kajian-kajian lepas telah mencadangkan bahawa penggunaan sistem maklumat pengurusan projek mempunyai kesan positif keatas kejayaan pelaksanaan projek. Dengan menggunakan faktor-faktor penentu kejayaan sistem seperti yang dicadangkan oleh DeLone dan McLean dalam *Information System Success Model* (ISSM), iaitu kualiti sistem, kualiti maklumat dan kualiti perkhidmatan, kajian ini cuba memberikan pemahaman tentang kesan penggunaan SPP II keatas kejayaan pelaksanaan projek-projek awam dan juga faktor-faktor penentu yang mempengaruhi keberkesanan sistem tersebut. Hasil dapatan menunjukkan secara umumnya pengguna SPP II di Kementerian Pertanian dan Industri Asas Tani bersetuju sistem ini merupakan sistem yang berkesan dalam menyokong pengurusan dan pemantauan projek. Ketiga-tiga faktor kualiti sistem, kualiti maklumat dan kualiti perkhidmatan didapati mempunyai hubungan yang signifikan dengan keberkesanan sistem. Selanjutnya, faktor kualiti maklumat didapati sebagai faktor yang paling memberi kesan terhadap sebarang perubahan keatas keberkesanan sistem SPP II.

Katakunci: SPP II, keberkesanan sistem, kualiti sistem, kualiti maklumat dan kualiti perkhidmatan.

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LIST OF ABBREVIATIONS

DOI	:	Diffusion of Innovation
EPU, PMO	:	Economic Planning Unit, Prime Minister's Office
eGovernment	:	Electronic Government
ICT	:	Information and communication technology
ICU, PMO	:	Implementation and Coordination Unit, Prime Minister's Office
IS	:	Information System
ISSM	:	Information System Success Model
InfoQ	:	Information Quality
MoA	:	Ministry of Agriculture and Agro-Based Industry
MoF	:	Ministry of Finance
PMIS	:	Project Management Information System
PMS I	:	Project Monitoring System I
PMS II	:	Project Monitoring System II
SETIA	:	*Sistem Maklumat Agensi-agensi Pusat Yang Disatukan*
SIAP	:	*Sistem Penjadualan Yang Bersepadu*
SMBSS	:	*Sistem Maklumat Bersepadu* SETIA/SIAP
SPP II	:	*Sistem Pemantauan Projek II*
TAM	:	Technology Acceptance Model
TRA	:	Theory of Reasoned Action
UTAUT	:	Unified Theory of Acceptance and Use of Technology

SysE	:	System Effectiveness
SysQ	:	System Quality
ServQ	:	Service Quality

CHAPTER 1

INTRODUCTION

1.1 Background of study

The implementation process of public projects is the realization and translation of the various development policies formulated by the government. Public development projects were to be implemented by all ministries, departments and agencies with the aim to achieve the predetermined objectives of the overall policies. Successful project execution means a better chance for the policies to be realised. Therefore, the process of planning, monitoring and evaluation of projects must be carried out on a systematic and regular manner as they are important in ensuring the success of the projects (ICU PMO, 2012).

To assist the ministries, departments and agencies in project management and monitoring tasks, the government had introduced various versions of project management information system. Beginning with the highly manual Red Book (Buku Merah) until the information technology (IT) based Integrated Central Agencies Information System (*Sistem Maklumat Agensi-agensi Pusat Disatukan*-SETIA), steps had been continuously taken to ensure the effectiveness of public project management. The introduction of Project Monitoring System II (PMS II) in 2001 marked Malaysia's continued effort to utilise information, communication technology (ICT) in public sector project implementation and monitoring activities. The implementation of PMS II is

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REFERENCES

Ali, A.S.B., & Money,W.H. (2005). A study of project management system acceptance. Proceedings of the 38th Hawaii International Conference of Systems Science, Hawaii, USA.

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. *Springer Series in Social Psychology* (Kuhl, J. & Beckmann, J. Eds.) 11–39, Springer, Berlin, Germany.

Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behaviour and Human Decision Processes, 50*(2), 179–211.

Amami, M., Beghini, G., & La Manna, M. (1993). Use of project management information system for planning information systems development projects. *International Journal of Project Management, 11*(1), 21–8.

Atkinson, R. (1999). Project management: Cost, time and quality, two best guesses and a phenomenon, it's time to accept other success criteria. *International Journal of Project Management, 17*(6), 337-42.

Baccarini, D. (1999). The logical framework method for defining project success. *Project Management Journal, 30*(4), 25-32.

Baker, B. N., Murphy, D.C. & Fisher, D. (1988). *Factors affecting project success.* In Cleland, D. I. & King, W. R. (Eds.) Project Management Handbook, (2nd. Edition). New York: Van Nostrand Reinhold.

Bandura, A. (1986). *Social Foundations of Thought and Action: A Social Cognitive Theory.* Englewood Cliffs, NJ: Prentice-Hall.

Brynjolfsson, E., Hitt, L.M. & Yang, S. (2002). Intangible assets: how computers and organizational structure affect stock market valuations. *Brookings Papers on Economic Activity,* 1, 137.

Caniëls, M. C., & Bakens, R. J. (2012). The effects of project management information systems on decision making in a multi project environment. *International Journal of Project Management, 30*(2), 162–175.

Chua, Y. P. (2012). *Kaedah dan statistik penyelidikan: Asas statistik penyelidikan buku 2.* (2nd. ed.) Kuala Lumpur: McGraw Hill (Malaysia).

Clarke, A. (1999). A practical use of key success factors to improve the effectiveness of project management. *International Journal of Project Management, 17*(3), 139-145.

Cleland, D.I. (1986). Measuring success: the owner's viewpoint. Proceedings of the 18th Annual Seminar/ Symposium (Montreal/Canada), 6-12. Upper Darby, PA: Project Management Institute.

Crawford, L. (2002). Project performance assessment. Unpublished masters's thesis. UTS/ESC-Lille. Paris, France.

Compeau, D.R., Higgins, C.A., & Huff, S. (1999). Social cognitive theory and individual reactions to computing technology: A longitudinal study. *MIS Quarterly, 23*(2), 145–158.

Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–339.

Davis, F.D., Bagozzi, R.P., & Warshaw, P.R. (1989). User acceptance of computer technology: A comparison of two theoritical models. *Management Science, 35*(8), 982-1003.

Davis, F.D., Bagozzi, R.P., & Warshaw, P.R. (1992). Extrinsic and intrinsic motivation to use computers in the workplace. *Journal of Applied Social Psychology, 22*(14), 1111–1132.

Davis, J. (1971). *Elementary survey analysis*. Englewood, New Jersey: Prentice Hall.

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

Doll, W.J., & Torkzadeh, G. (1988). The measurement of end user computing satisfaction. *MIS Quarterly, 12*(2), 258-274.

Doll, W.J., Xia, W., & Torkzadeh, G. (1994). A confirmatory factor analysis of the end-user computing satisfaction instrument. *MIS Quarterly, 18*(4), 453–461.

Economic Planning Unit, Prime Minister's Office. (2004). *Development Planning in Malaysia*, Putrajaya: Economic Planning Unit, Prime Minister's Office.

Fishbein, M. (1967). Attitude and the prediction of behaviour. In *Readings in Attitude Theory and Measurement* (Fishbein M, Ed) 477–492, Wiley, New York.

Fishbein, M. & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.

Freeman, M., & Beale, P. (1992). Measuring project success. *Project Management Journal, 23* (1), 8-17.

Gravetter, F. J.; Forzano & Lori, B.A,. (2012). *Research methods for the behavioral sciences (4th Edition)*. Belmont, CA: Wadsworth.

Hair, J.F., Anderson, R.E., Tatham, R.L., & Black, W.C. (2007). *Research methods for business*. West Sussex, England: John Wiley & Sons Ltd.

Implementation and Coordination Unit, Prime Minister's Office. (2010). *Arahan No. 1, 2010, Majlis Tindakan Negara*, Putrajaya: Implementation and Coordination Unit, Prime Minister's Office.

Implementation and Coordination Unit, Prime Minister's Office. (2012). *Buku panduan pengurusan projek fizikal*, Putrajaya: Implementation and Coordination Unit, Prime Minister's Office.

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

Kaliannan, M., Halimah, A., & Raman, M. (Eds.). (2007). Technology adoption in the public sector: An exploratory study of e- government in Malaysia. Proceedings of the 1st International Conference on Theory and Practice of Electronic Governance ICEGOV '07 Macao. December 2007.

Kettinger, W.J., & Lee, C.C. (1995). Perceived service quality and user satisfaction with the information services function. *Decision Sciences*, *25*(5-6), 737–765.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*, 607-610.

Lee, S.-K., & Yu, J.-H. (2012). Success model of project management information system in construction. *Automation in Construction*, *25*, 82–93.

Liberatore, M.J., & Pollack-Johnson B., (2003) Factors influencing the usage and selection of project management software. *IEEE Transportation Engineering Management*, *50*(2), 164–74.

Masrek, M. N. (2009). Reinventing public service delivery : The case of public information systems implementation in Malaysia. *International Journal of Public Information Systems*, 2009(1) 9–15.

Moore, G.C., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research, 2*(3), 192–222.

Munns, A., & Bjeirmi, B. (1996). The role of project management in achieving project success. *International Journal of Project Management*, *14*(2), 81–87.

Murphy, D., Baker, N., & Fisher, D. (1974). *Determinants of Project Success.* Boston: Boston College, National Aeronautics and Space Administration.

National Audit Department of Malaysia. (2011). *Auditor General's Report 2011.* Putrajaya: National Audit Department of Malaysia.

National Audit Department of Malaysia. (2013). *Auditor General's Report 2013.* Putrajaya: National Audit Department of Malaysia.

Nunnally, J. C. (1978). *Psychometric Theory (2nd Edition).* New York: MacGraw-Hill.

Olsen, R.P. (1971). Can project management be defined? *Project management quarterly, 2*(1), 12-14.

Petter, S., DeLone, W. H., & McLean, E. R. (2008). Measuring information systems success: Models, dimensions, measures, and interrelationship. *European Journal of Information Systems* 17, 236–263.

Pinto, J. K., & Slevin, D. P. (1988). Project success: Definitions and measurement techniques. *Project Management Journal, 19*(1), 67–72.

Pitt, L.F., Watson, R.T., & Kavan, C.B. (1995). Service quality: A measure of information systems effectiveness. *MIS Quarterly, 19*(2), 173–187.

Raymond, L., & Bergeron, F. (2008). Project management information systems: An empirical study of their impact on project managers and project success. *International Journal of Project Management, 26*(2), 213–220.

Rogers, E.M. (1962). *Diffusion of Innovations,* New York: The Free Press.

Roscoe, J.T. (1975). *Fundamental Research Statistics for the Behavioural Sciences* (2nd *Edition*). New York: Holt Rinehart & Winston.

Salkind, N. (2006). *Exploring research (6th Edition*). New Jersey: Pearson Prentice Hall.

Seddon, P.B. (1997). A respecification and extension of the DeLone and McLean model of IS Success. *Information Systems Research, 8*(3), 240–253.

Seddon, P.B., Staples, S., Patnayakuni, R., & Bowtell, M. (1999). Dimensions of information systems success. *Communications of the Association for Information Systems 2*(20), 2-9.

Sekaran.U (2003).*Research Method for Business: A skill building approach (4th Edition*). Illinois, U.S.A: John Wiley & Sons Ltd.

Sekaran, U., &Bougie, R. (2009).*Research methods for business: A skill building approach*. United Kingdom: John Wiley & Sons Ltd.

Shenhar, A.J., Levy, O., & Dvir, D. (1997). Mapping the dimensions of project success. *Project Management Journal. 28* (2), 5-13.

Siddiquee, N. A. (2008). E-Government and innovations in service delivery: The Malaysian experience. *International Journal of Public Administration, 31*(7), 797.

Taylor, S., & Todd, P.A. (1995). Understanding information technology usage: A test of competing models. *Information Systems Research, 6*(4), 591–570.

Thompson, R.L., Higgins, C.A., & Howell, J.M. (1991). Personal computing: Toward a conceptual model of utilization. *MIS Quarterly, 15*(1), 124–143.

Vallerand, R.J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. In *Advances in Experimental Social Psychology* (Zanna M.P., Ed) pp 271–360, Academic Press, New York.

Venkatesh, V., & Davis, F.D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science, 46*(2), 186–204.

Venkatesh, V., Morris, M.G. and Ackerman, P.L. (2000). A longitudinal field investigation of gender differences in individual technology adoption decision making processes. *Organizational Behaviour and Human Decision Processes, 83*(1), 33–60.

Venkatesh,V., Morris M.G., Davis, G. and Davis, F. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478.

Wang, Y.-S., & Liao, Y.-W. (2008). Assessing eGovernment systems success: A validation of the DeLone and McLean model of information systems success. *Government Information Quarterly, 25*(4), 717–733.

Wilkin, C., & Hewitt, B. (1999). Quality in a respecification of DeLone and McLean's IS success model. In Mehdi Khozrowpour (eds.), Proceedings of 1999 IRMA International Conference. Hershey, PA: Idea Group Publishing, 663–672.