

**CONTEXTUAL FACTORS, MANAGEMENT ACCOUNTING
SYSTEMS DESIGN AND MANAGERIAL PERFORMANCE:
EVIDENCE FROM EGYPTIAN HOSPITALS**

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**FACULTY OF BUSINESS AND ACCOUNTANCY
UNIVERSITY OF MALAYA
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**THESIS SUBMITTED IN FULFILMENT OF THE REQUIREMENTS
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ABSTRACT

This study was conducted within the health care industry to investigate the relationship between contingent variables, management accounting systems (MAS) information, and managerial performance. The proposed research framework utilizes the foundations of contingency and work performance theory to determine the contingent variables that influence the extent of use of MAS information; namely, technology, organizational structure, and perceived environmental uncertainty. In addition, it investigates how the appropriate fit between these contingent variables and MAS information characteristics (scope, timeliness, aggregated, and integrated information), which serve as the mediator, would enhance the managerial performance of Egyptian managers in health care. Finally, it examines the effect of hospital size on the relationship between the research contextual variables, MAS information, and managerial performance. Due to its complexity and continuous inept administration despite years following its reform, the Egyptian hospital industry was chosen as the ideal setting to investigate these relationships. In addition, the data analysis of this study used 200 responses from the managers of departments within Egyptian hospitals. Using partial least squares (PLS), the results reveal that the absence or partial support for the positive relationship between technology and MAS information may give attention to re-organize the Egyptian hospitals to make fit between the two variables. In addition, centralization needs to be deemphasized and greater attention should be given to decentralization instead. Moreover, the cognizance of both the internal and external environment in which Egyptian hospitals operate should be considered in designing MAS. Despite MAS information characteristics, such as broad scope, timeliness, and integrated information may provide motivation for Egyptian managers to enhance their managerial

performance. The absence of the mediating role of MAS information in Egyptian hospitals explains the resistance within Egyptian hospitals (especially among physicians) against MAS that have been provided during healthcare reform. Therefore, MAS designers and Egyptian policy makers should pay attention to eliminate any constraints that limit the professional power of physicians and decentralize decision making via delegating sufficient authority to lower level managers to influence the design of the accounting systems. Finally, the partial support for the existing positive effect for hospital size provides motivation to determine the appropriate hospital size, for both the private and government sectors, that will gain advantage from using more sophisticated accounting systems.

Keywords: Management accounting systems, Contingency factors, Managerial performance, Healthcare reform, Egypt.

ABSTRAK

Kajian ini telah dijalankan dalam industri penjagaan kesihatan untuk mengkaji hubungan di antara pembolehubah luar jangka, maklumat sistem perakaunan pengurusan (MAS), dan pengurusan prestasi. Rangka kerja penyelidikan yang dicadangkan menggunakan asas kontingensi dan teori prestasi kerja untuk menentukan pembolehubah luar jangka yang mempengaruhi tahap penggunaan maklumat MAS; iaitu, teknologi, struktur organisasi, dan anggapan ketidaktentuan persekitaran. Di samping itu, ia menyiasat bagaimana patut yang sesuai antara kedua-pembolehubah luar jangka dan ciri-ciri MAS maklumat (skop, ketepatan masa, agregat, dan maklumat bersepadu), yang bertindak sebagai pengantara, akan meningkatkan prestasi pengurusan pengurus Mesir dalam penjagaan kesihatan. Akhirnya, ia mengkaji kesan saiz hospital pada hubungan antara penyelidikan konteks pembolehubah, maklumat MAS, dan pengurusan prestasi. Disebabkan kerumitan dan pentadbiran tidak cekap berterusan walaupun tahun selepas reformasi, industri hospital Mesir telah dipilih sebagai suasana ideal untuk menyiasat hubungan ini. Di samping itu, analisis data kajian ini menggunakan 200 jawapan daripada pengurus jabatan dalam hospital Mesir. Menggunakan sebahagian kuasa dua terkecil (PLS), keputusan menunjukkan bahawa ketiadaan atau sokongan sebahagian untuk hubungan positif di antara teknologi dan maklumat MAS boleh memberi perhatian untuk menyusun semula hospital Mesir untuk membuat patut di antara dua pembolehubah. Di samping itu, pemusatan perlu deemphasized dan perhatian yang lebih perlu diberikan kepada desentralisasi. Selain itu, kira kedua-dua persekitaran dalaman dan luaran di mana hospital Mesir beroperasi perlu dipertimbangkan dalam merekabentuk MAS. Walaupun ciri-ciri MAS maklumat, seperti skop yang luas, ketepatan masa, dan maklumat bersepadu boleh

memberi motivasi bagi pengurus Mesir untuk meningkatkan prestasi pengurusan mereka. Ketiadaan peranan pengantara maklumat MAS di hospital-hospital Mesir menerangkan rintangan dalam hospital Mesir (terutama di kalangan pakar perubatan) terhadap MAS yang telah disediakan semasa penjagaan kesihatan reformasi. Oleh itu, MAS pereka dan pembuat dasar Mesir perlu memberi perhatian untuk menghapuskan apa-apa kekangan yang menghadkan kuasa profesional doktor dan membahagikan membuat keputusan melalui mewakili kuasa yang mencukupi kepada pengurus tahap yang lebih rendah untuk mempengaruhi reka bentuk sistem perakaunan. Akhir sekali, sokongan sebahagian untuk kesan positif untuk saiz hospital sedia ada menyediakan motivasi untuk menentukan saiz hospital yang sesuai, untuk kedua-dua sektor swasta dan kerajaan, yang akan memperolehi kelebihan daripada menggunakan sistem perakaunan yang lebih canggih.

Keywords: sistem perakaunan Pengurusan, faktor Kontingensi, prestasi Pengurusan, Penjagaan Kesihatan reformasi, Mesir.

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

DEDICATION

This thesis is especially dedicated to:

My late mother, my father, my wife and my children, Shahd and Muhammad

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Acronyms

MAS	Management Accounting System
MA	Management Accounting
MCS	Management Control Systems
AIS	Accounting Information Systems
WHO	World Health Organization
PHC	Primary Health Care
MCH	Maternal and Child Health
MOHP	Ministry of Health and Population
HIO	Health Insurance Organization
NGO	Non-Governmental Organization
GOE	Government of Egypt
GDP	Gross Domestic Product
FASB	Financial Accounting Standards Board
PEU	Perceived Environmental Uncertainty
CEOs	Chief Executive Officers
MDs	Medical Directors
CAPMAS	Central Agency for Public Mobilization and Statistics
SBU	Strategic Business Unit
SEM	Structural Equation Modelling
PLS	Partial Least Squares
AVE	Average Variance Extracted

LIST OF PUBLICATIONS

Indexed Journal

Salah A. Hammad, Ruzita Jusoh and Elaine Yen Nee Oon, (2010) “Management accounting system for hospitals: a research framework” *Industrial Management & Data Systems*, Vol. 110 No. 5, pp. 762-784. (ISI-Cited Publication)

International Conference Proceedings

Salah A. Hammad, Ruzita Jusoh and Elaine Yen Nee Oon, “Factors Influencing Management Accounting System Designs That Enhance Managerial Performance of Egyptian Hospitals: A Research Framework” at International Management Accounting Conference (IMAC 5), Kuala Lumpur, Malaysia, 19 -21 October 2009.

Salah A. Hammad, Ruzita Jusoh and Imam Ghozali, “Time for Change: Management Accounting System for Enhance Managerial Performance of Egyptian Hospitals” at the 12th Asian Academic Accounting Association (AAAA) Annual Conference, Bali, Indonesia, 8-12 October 2011.

Salah A. Hammad, Ruzita Jusoh and Imam Ghozali, “The Intervening Role of Management Accounting Systems Within Egyptian Hospitals” sent and accepted by Global Accounting and Organizational Change Conference (GAOC 2012), Sunway Resort Hotel and Spa, Kuala Lumpur, Malaysia, 14 – 17 July 2012.