



UNIVERSITI PUTRA MALAYSIA

**FACTORS AFFECTING THE ADOPTION OF INFORMATION
TECHNOLOGY APPLICATIONS IN THE FOODSERVICE SECTOR IN
MALAYSIA**

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GSM 2008 2



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By

AHMAD FAREED ISMAIL

**Thesis Submitted to the Graduate School of Management,
Universiti Putra Malaysia,
in Fulfilment of the Requirement for the Degree Master of Science**

April 2008



Dedicating the Fruits of This Research Especially to

*My beloved Emak & Ayah,
And my family*



Abstract of thesis presented to the Senate of Universiti Putra Malaysia
in fulfillment of the requirement for the Degree of Master of Science

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Chairman : Associate Professor Dr. Syed Abdul Kadir Alsagoff

Faculty : Graduate School of Management

In recent years, many organizations have invested tremendously in information technology (IT) aiming to improve their firms' performance. Previous literature suggest that various factors play crucial roles in the adoption of information systems. However, there is little empirical research about the factors affecting the adoption of IT applications in the foodservice sector. This study aims to determine the factors affecting the adoption of IT applications (specifically on the back-of-house and front-of-house IT applications) in the foodservice sector. The research model posits relationships of three major factor groups; a) the organizational factor group, b) environmental factor group, and c) technological factor group. Under these three factor groups there are ten factors to be tested against the adoption decision of the two foodservice IT applications. The factors are 1) *top management support*, 2) *organizational size*, 3) *relative advantage*, 4) *strategic relevance*, 5) *financial slack*, 6) *IT support infrastructure*, 7) *competitive pressure*, 8) *IT skilled employees*, 9) *ease of use*, and 10) *compatibility*. The theoretical model of this study is based on the Diffusion of Innovation (DOI) Theory.



In this study, survey questionnaires were distributed to the Chief Executive Officers (CEO)/ or owners, or Chief Information Officers (CIO), or Management Information Systems Managers/IT Managers, or Operation Managers or Account/ Finance Manager of the available 323 foodservice companies. The foodservice operators involved in the sampling were from restaurants belonging to foodservice chains and independent restaurants in Kuala Lumpur and Selangor. The results showed that the response rate was 49.5%. A multiple regression analysis for the adoption of back-of-house IT applications and multinomial logistic regressions for front-of-house IT applications were used to test the hypotheses. The results revealed that factors such as *top management support*, *strategic relevance*, *financial slack*, *IT skilled employees*, *ease of use*, and *compatibility* affected the adoption of back-of-house IT applications. However, only the *relative advantage* and *competitive pressure* were found to be significant for the adoption of front-of-house IT applications. This suggests that different segments of business operations tended to influence different factors affecting the adoption of IT applications in the foodservice industry. Therefore, the results of this study provide some theoretical and practical implications of factors affecting the adoption of IT in the foodservice sector.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
sebagai memenuhi keperluan untuk ijazah Master Sains

**FAKTOR-FAKTOR MEMPENGARUHI PENERIMAAN APLIKASI
TEKNOLOGI MAKLUMAT DALAM SEKTOR PERKHIDMATAN
MAKANAN DI MALAYSIA**

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Dalam tahun-tahun kebelakangan ini, banyak organisasi telah melabur sangat banyak dalam teknologi maklumat (TM) bertujuan untuk meningkatkan prestasi syarikat. Literatur terdahulu mencadangkan bahawa banyak faktor yang memainkan peranan penting dalam penerimaan sistem maklumat. Walaubagaimanapun, terdapat hanya sedikit kajian empirikal berkaitan faktor-faktor yang mempengaruhi penerimaan aplikasi TM dalam sektor perkhidmatan makanan. Kajian ini bermatlamat mengenalpasti faktor-faktor yang mempengaruhi penerimaan aplikasi TM (khususnya dalam aplikasi TM di bahagian penyediaan dan bahagian penyajian) dalam sector perkhidmatan makanan. Model kajian ini mencadangkan hubungan tiga kumpulan faktor utama iaitu a) faktor organisasi, b) faktor persekitaran, dan c) faktor teknologi. Dibawah tiga kumpulan ini terdapat 10 faktor yang akan diuji terhadap keputusan penerimaan bagi dua aplikasi TM perkhidmatan makanan yang telah dinyatakan. Faktor-faktor tersebut adalah 1) sokongan pengurusan atasan, 2) saiz organisasi, 3) kelebihan relatif, 4) kepentingan strategik, 5) kekurangan

kewangan, 6) infrastruktur sokongan bagi TM, 7) tekanan persaingan, 8) pekerja berkemahiran TM, 9) mudah digunakan, dan 10) keserasian. Model teori yang digunakan dalam kajian ini adalah berdasarkan kepada Teori Difusi Inovasi.

Dalam kajian ini, kajian soal selidik diedarkan kepada Ketua Pengawai Eksekutif/ atau pemilik, atau Ketua Pegawai Informasi, atau Pengurus Bahagian Pengurusan Sistem Maklumat/Pengurus TM, atau Pengurus Operasi atau Pengurus Kewangan/Akaun di dalam 323 syarikat perkhidmatan makanan. Pengusaha perkhidmatan makanan yang terlibat dalam persampelan terdiri daripada restoran rangkaian dan persendirian di Kuala Lumpur dan Selangor. Keputusan menunjukkan kadar maklumbalas yang diterima adalah sebanyak 49.5%. Analisa regresi pelbagai bagi aplikasi TM di bahagian penyediaan dan analisa regresi logistik multinomial bagi aplikasi TM di bahagian penyajian telah digunakan untuk menguji hipotesis. Keputusan mendedahkan faktor-faktor seperti *sokongan pengurusan atasan, kepentingan strategik, kekurangan kewangan, pekerja berkemahiran TM, mudah digunakan, dan keserasian* mempengaruhi penerimaan aplikasi TM di bahagian penyediaan. Bagaimanapun hanya *kelebihan relatif, dan tekanan persaingan* telah dikenalpasti sebagai signifikan bagi penerimaan aplikasi TM di bahagian penyajian. Ini mencadangkan bahawa bahagian yang berbeza dalam operasi perniagaan berkecenderungan mempengaruhi faktor-faktor berbeza dalam penerimaan aplikasi TM dalam industri perkhidmatan makanan. Justeru, keputusan kajian ini mampu memberikan implikasi teoritikal dan praktikal terhadap faktor-faktor mempengaruhi penerimaan TM dalam sektor perkhidmatan makanan.

ACKNOWLEDGEMENTS

First and foremost, I humbly wish to thank the All Mighty Allah Subhanawataala for health, time and strength that He gave me to complete this research. All the challenges and obstacles faced while completing this study has thought me to love Him more then ever. I really appreciated the beautiful experiences that He gave me. Alhamdullillah.

My sincere appreciation goes to my advisor, Associate Professor Dr. Syed Abdul Kadir AlSagoff for his guidance, support and continued encouragement. He provided me with new experiences doing a research on management area which is something new to me. He never lost faith on me and believed that I can do my best for this research. It was a very valuable experience, one to dream about, doing this research under his supervision. Thank you very much Dr. Syed.

Next, my deepest gratitude also goes to all my co-supervisors, Assoc. Prof. Dr. Murali Sambasivam and Dr. Boo Huey Chern. I am more than grateful for your help, guidance, concern, patience, friendship and constructive comments throughout the course of my study. Both of you were the one that make me believes that “there is always a light at the end of the tunnel”. This long and adventurous journey will never end if not with the generous guidance of both of you. Until to the end of time, I will never forget these two important names in my precious journey.



Lastly, I wish to thank my dearest parents (*Ayah* and *Emak*) and my beloved family for their understanding, financial and moral support. I also owe my thanks to my best friends, Hafandi Ahmad and Ungku Fatimah for their moral encouragement and support throughout the duration of my study.



I certify that the Examination Committee has met on 29th January 2008 to conduct the final examination of Ahmad Fareed Ismail on his Master of Science thesis entitled “Factors Affecting the Adoption of Information Technology Applications in the Foodservice Sector in Malaysia” in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulations 1981. The Committee recommends that the candidate be awarded the relevant degree. Members of the Examination Committee are as follows:

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LIST OF ABBREVIATIONS

IT	Information Technology
ECR	Electronic Cash Register
POS	Point-of-Sales
TMS	Table Management Systems
GDS	Global Distribution Systems
CRS	Central Reservation Systems
EDP	Electronic Data Processing
MIS	Management Information Systems
IS	Information Systems
MOSTI	Ministry of Science, Technology and Innovation
MDT & CA	Ministry of Domestic Trade and Consumer Affairs
MECD	Ministry of Entrepreneur and Co-Operative Development
MSC	Multimedia Super Corridor
DOI	Diffusion of Innovation
EDI	Electronic Data Interchange
TRA	Theory of Reasoned Action
TAM	Technology Acceptance Model
TPB	Theory of Planned Behavior
UTAUT	Unified Theory of Acceptance and Use of Technology
SCM	Supply Chain Management



EIS	Executive Information Systems
CAD	Computer Aided Design
CDM	Centralized Data Management
CEO	Chief Executive Officers
CFA	Confirmatory Factor Analysis
d.f.	Degrees-of-freedom
NFI	Normalized Fit Index
CFI	Comparative Fit Index
RMSEA	Root Mean Square Error of Approximation
ANOVA	Analysis of Variance



CHAPTER 1

INTRODUCTION

1.0 Introduction

This chapter 1 covers four major sections including research background, problem statements, objectives, and the significance of this research. Section 1.1, explained the scenario of the foodservice industry, particularly on the importance of information technology (IT) and it also gives an outline of the whole research including the reasons for conducting it. Subsequently, in section 1.2 the reasons of conducting this research that mentioned earlier are elaborated. The issues currently lacking in the food service industry are discussed and are used as the basis in the establishment of the research objectives as stated in section 1.3. Finally, in section 1.4 the general and specific contributions of this research are discussed in different perspectives from the viewpoint of practitioners, policy makers and suppliers.

1.1 Background

The foodservice sector is a profitable industry in the world and it is one of the hospitality sub-industries that have constantly experiences change and growth by time (Spears & Gregoire, 2003). According to Euromonitor (2004), the positive trend of this industry in recent years is related to globalization and the robust economic growth in many countries. Additionally, the increased number of tourists flow, and the variety of



cuisine offered in different places also contributed to the growth of this industry. Thus, as the industry grows and becomes more complex, foodservice operators have started to strategize their companies in order to gain competitive advantages within the industry.

In today's information edge, one of the strategic decisions considered by most of the foodservice operators is to invest in information technology (IT) applications. There are various definitions and interpretations by researchers to describe IT based on their interest of study. However, in general, IT is simply defined as the processing of information by collection of computing systems in an organization (Rainer, Turban and Potter, 2007). IT also refers to both the hardware and software that are used to store, retrieve, process, and manipulate data into meaningful information which could be further processed to increase its value (Cashman, 2007).

In this study, IT within the perspective of the foodservice sector, was defined as all technology for managing all types of data related to the foodservice business. The data might be, either data related to consumer or sales purpose data or data from the front-of-house to back-of-house that constituted the whole foodservice systems. These types of data must be managed and transformed properly into meaningful information to increase company efficiency and productivity (Grimes, 2001). Based on Jones (1995), the foodservice systems key features are the back-of-house and front-of-house operations. He explained that typical back-of-house processes include materials storage, and food production; whereas front-of-house processes include guest reception, restaurant service, bar operations and lounges. In other words, the back-of-house

systems viewed as processes that are out of sight of the customer, while the front-of-house processes performed with the customer's involvement.

Organizations that have decide to invest in IT applications basically aims to improve their firms' performance and to gain competitive advantages (Byrd & Davidson, 2003; Li & Ye, 1999; Winata & Mia, 2005). In addition, advanced IT introduced in many industries changed the way they conducted their businesses (Buick, 2003; Crowston & Myers, 2004; Hill, 2000; Lai & Li, 2005; Lee-Partridge, Teo, & Lim, 2000; Ma, Buhalis, & Song, 2003; McKeown & Philip, 2003; Mutch, 1993; Namasivayam, O'Connor & Frew, 2002; O'Connor & Murphy, 2004; Schiefer, 2004; Siguaw & Enz, 1999; and Winata & Mia, 2005). Moreover, IT seemed to enable organizations to restructure themselves in order to achieve economies of scale and to handle increased complexity in their organizations (Alkadi, Alkadi, & Totaro, 2004). Importantly, Ang and Pavri (1994) have stated that IT also enabled businesses to drive down the costs of products, processes, and subsequently improve their performance.

In the foodservice sector, examples of IT applications are electronic cash registers (ECR), integrated Point-of-Sale (POS) system, web technologies, the credit card processing systems, Table Management Systems (TMS), kitchen display systems, reporting features/extensive front-of-house reporting, accounting applications, menu management systems, database systems, inventory control system, and labor management systems (Ansel & Dyer, 1999; Pappas, 1997; and Van Egmond, 1985). Most of these applications are widely available and could significantly enhance the



performance of an organization. However, Ansel and Dyer (1999) posited that the trend in commercial foodservice sector seemed to be slow in adopting the current IT applications in their businesses. This is because most of the foodservice operators view IT applications as an additional cost of doing business, rather than as an investment in future profitability. Foodservice operators also tried to avoid increased costs because they usually wanted to gain more on profit margins. This phenomenon was slightly different among the foodservice operators in the U.S.A as reported by a recent study conducted by the Hospitality Technology Magazine in the Seventh Annual Foodservice Technology Study, which mentioned that there has been an increase of 65% in the number of IT adoption and implementation in the last three years of 2002 to 2005 (The Seventh Annual Foodservice Technology Study, January, 2005).

Within the hospitality industry, studies related to IT in the hotel sector received more attention from researchers, for example, on the global distribution systems (GDS) and electronic distribution, central reservation system (CRS), Internet usage, and development of new technologies in the hotel sector (Aksu & Tarcan, 2002; Buick, 2003; Dougan & Bronson, 2003; Ma et al., 2003; Wei, Ruys, van Hoof, & Combrink, 2001; Mutch, 1993; O'Connor & Frew, 2002, 2004; Siguaw & Enz, 1999). In contrast, the numbers of research on IT usage in the foodservice sector are still meager compared to the hotel sector. For instance, Kasavanna (1997) studied specifically on the POS systems usage in the foodservice sector and Ansel and Dyer (1999), discussed the framework for restaurant IT and proposed a new integrated foodservice system. In conjunction with this limited research interests, O'Connor and Murphy (2004) had

