TECHNOLOGY AND INNOVATION MANAGEMENT AWARENESS AND PRACTISE A CASE STUDY IN BRITISH AMERICAN TOBACCO GSD (KL) SDN BHD

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To my Mother & Farther

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ABSTRACT

Technology and innovation are two important elements in improving efficiency, productivity and competitiveness in organisations. Therefore, what differentiates successful organisations from others is their management of technology and innovation towards awarenees and practise. The objective of this paper is to investigate the Level of Understanding Technology and Innovation Management Awareness and Practise at BAT GSDKL Sdn Bhd based on Technology Audit Model developed by Garcia-Arreola (1996). It sought to assess the relationship between the employees' and organisation in managing technological innovation awareness and practices at BAT GSDKL Sdn Bhd. A descriptive research design was employed in this study, with data collected through the use of a two parts of questionnaire: the demographic data of respondents and the importance and performance on level of understanding of technology and innovation awareness and practices in BAT GSDKL Sdn Bhd by using the objective of this study. This study will be limited to the Local Management to the Senior Leadership Team in BAT GSDKL Sdn Bhd at Technology Park Malaysia, Bukit Jalil, Kuala Lumpur. Technology Audit Managment' questionnaires were used as an instrument to examine the respondents and interviews. Inferential statistics of ANOVA and T-test was used to examine the direct relationship involving the dependant variable: employees and organization toward level of understanding; and the independent variables: gender, race, designation, and education background. The result from this study is to assess the test is any significant assess on the organisation towards technology and innovation management awareness and practise BAT GSDKL Sdn Bhd and whereas second test as well revealed a positive relationship of statistically significant relationship between demographic factors of education and race among the tested variables through the nominal measurement. This test indicates that the variable had moderate impact on the strength between demographics factors and different level of understanding towards technology and innovation management awareness and practice. In furthering this study, it is also recommended for an indeed enhancement on the organisation understanding on toward technology & innovation management awareness and practise in BAT GSDKL Sdn Bhd.

ABSTRAK

Teknologi dan inovasi adalah dua elemen penting dalam meningkatkan kecekapan, produktiviti dan daya saing dalam organisasi. Oleh kerana itu, apa yang membezakan organisasi yang berjaya dari orang lain adalah mereka pengurusan teknologi dan inovasi terhadap kesedaran dan amalan. Tujuan makalah ini adalah untuk mengetahui Tingkat Pemahaman Teknologi dan Kesedaran Pengurusan Inovasi dan Amalan di BAT GSDKL Sdn Bhd berdasarkan Audit Teknologi Model yang dibangunkan oleh Garcia-Arreola (1996). Ini adalah unutk melihat hubungan antara pekerja dan organisasi dalam menguruskan kesedaran inovasi teknologi dan amalan di Sdn Bhd BAT GSDKL Sdn Bhd. Penilaian analisis deskriptif telah digunakan dalam kajian ini, dengan data yang dikumpul melalui penggunaan dua bahagian borang soal selidik: demografi data responden dan pentingnya dan prestasi pada tahap pemahaman teknologi dan kesedaran inovasi dan amalan-amalan di BAT GSDKL Sdn Bhd, dan di dibentuk berdasarkan objektif kajian iaitu di bahagian maklumat diri responden terhadap kepentingan dan pelaksanaan terhadap tahap kefahaman terhadap pengurusan teknologi & inovasi kesedaran dan amalan di BAT GSDKL Sdn Bhd . Analisis ini telah dihadkan kepada Pengurusan Lokal kepada Pengursan Senior di BAT GSDKL Sdn Bhd di Technology Park Malaysia, Bukit Jalil, Kuala Lumpur. Soalan-soalan ‘Technology Audit Managment’ digunakan sebagai instrumen untuk menguji responden dan kaedah wawancara. Dapat disimpulkan statistik ANOVA dan T-test digunakan untuk menguji hubungan langsung melibatkan pembolehubah dependen: pekerja dan organisasi terhadap tahap pemahaman, dan pembolehubah bebas: jenis jantina, bangsa, jawatan, latar belakang pendidikan. Hasil dari kajian ini adalah untuk menguji signifikan antara kesedaran terhadap teknologi dan inovasi pengurusan dan amalan BAT GSDKL Sdn Bhd dan sedangkan ujian kedua juga menunjukkan hubungan yang positif dalam hubungan secara statistik signifikan antara faktor demografi pendidikan dan bangsa melalui pembolehubah diuji melalui pengukuran nominal. Ujian ini menunjukkan bahawa pembolehubah moderat merupakan kekuatan antara faktor demografi dan tahap yang berbeza dari pemahaman terhadap kesedaran dan amalan. Dalam meneruskan kajian ini, juga disyorkan untuk meningkatkan tahap kesedaran dan amalah terhadap pengurusan technology dan inovasi di BAT GSDKL Sdn Bhd.

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CHAPTER 1

INTRODUCTION

1.1 Background of the study

Post-industrial organisations today are knowledge-based organisations and their success and survival depend on creativity, innovation, discovery and inventiveness. In a National Research Council Report in 1987 MOT was defined as an interdisciplinary field concerned with planning, development and implementation of technological capabilities to shape and accomplish the operational and strategic objectives of an organization (Khalil TM, 2000). An effective reaction to these demands leads not only to changes, in individuals and their behaviour, but also to innovative changes in organisations to ensure their existence (Read, 1996). Companies of today are facing increased turbulence and complexity in the business environment. (D'Aveni, 1994) categorizes the situation in its extreme form as hyper-competition on creating both innovation and sustainable competitive advantage. This paper describes a conceptual model the technology and innovation management awareness and practise by BAT GSDKL Sdn Bhd. Especially in the last decades; company had to be seriously concerned with technology and innovation in order to be successful. The key to optimising

organizational performance in the short-term and succeeding in the long-term is through innovation. Innovation is the only way to effectively close the gap between customer demands and decreasing resources. Innovation allows us to do more with less (Andrew Papageorge, 2003).

1.2 Problem Statement

Managing technological innovation in BAT GSDKL Sdn Bhd is important due to large capital of investment has been made by BAT GSDKL Sdn Bhd in the process of development and adopting of new technologies and measuring the technological innovation capabilities. BAT GSDKL Sdn Bhd is concerned with exploring and understanding technology and innovation awareness and practice as a corporate resource that determines both the strategic and operational capabilities of the firm in designing and developing products and services for maximum customer satisfaction, corporate productivity, profitability and competitiveness

In this research, the following questions must be addressed and to be considered apriority issues to BAT GSDKL Sdn Bhd. The central research question is subdivided into the following more specific research questions:

i. What is the different level of understanding employee's awareness of technology & innovation management in BAT GSDKL Sdn Bhd?

ii. What is the different level of understanding employee's practise of technology & innovation management in BAT GSDKL Sdn Bhd?

iii. Is there a positive relationship between level understanding employee's awareness of technology & innovation management in BAT GSDKL Sdn Bhd?

iv. Is there a positive relationship between the variables and the factor of demography?

1.3 Research Aim

The aim if the research attempts to provide an in depth level of understanding of the technology and innovation management in BAT GSDKL Sdn Bhd, from the aspects of awareness and practice using Technology Audit Model.

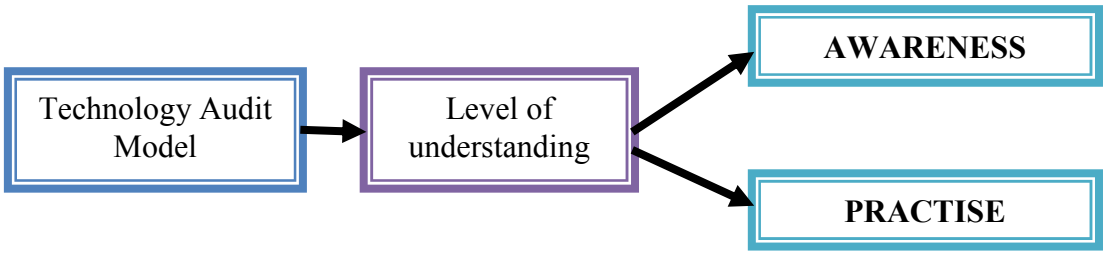

Figure 1.1 Research Aim

1.4 Research Objective

The objectives of the research were as follows:

i. To determine the level of understanding towards technology and innovation management awareness in BAT GSDKL Sdn Bhd.

ii. To determine the level of understanding towards technology and innovation practise in BAT GSDKL Sdn Bhd

iii. To determine the relationship between factors (i) and (ii) by demographic factors such as gender, race, age, designation, work experience, and level of education in BAT GSDKL Sdn Bhd.

The concern of this research is to To determine the different level of understanding towards technology and innovation management awareness &

practise in BAT GSDKL Sdn Bhd. As well as to To determine the relationship between factors (i) and (ii) by demographic factors such as gender, race, age, designation, work experience, and level of education.

British American Tobacco GSDKL Sdn Bhd is one of the global information technology (IT) facilities and services unit, that has been selected to form a single virtual organization to provide IT shared services for British American Tobacco's businesses in the Asia Pacific region and globally. British American Tobacco Group Service Delivery is an organization that provides IT shared services for British American Tobacco's businesses in the Asia Pacific region and globally. Based in Technology Park Malaysia, British American Tobacco Group Service Delivery's four main lines of services are, Data Centre and infrastructure Management, Business Application and Technical Support, Business and Project Consultancy as well as IT Skills Development and Training. As a Centre of Excellence in IT shared services - we energise, develop, retain and attract the best individuals who have the ability and drive to deliver competitive advantage.

British American Tobacco has been in business for more than 100 years, trading through the turbulence of wars, revolutions and nationalisations as well as all the controversy surrounding smoking. The business was formed in 1902, as a joint venture between the UK's Imperial Tobacco Company and the American Tobacco Company founded by James 'Buck' Duke.

Despite its name, derived from the home bases of its two founding companies, British American Tobacco was established to trade outside both the UK and the USA, and grew from its roots in dozens of countries across Africa, Asia, Latin America and continental Europe. As core technology developments take longer than shorter product and service initiatives, by separating research and invention from product and service development, companies can achieve stretch without incurring too much risk.

Technology and innovation is about achieving business strategies and competitive advantage through the application of contemporary technology based solutions. Areas covered by technology include business analysis and consultancy, project management and information management.

About BAT Group Service Delivery (Kuala Lumpur) Sdn Bhd

IT is a £400m operation serving over 43,000 customers in 132 markets. We manage 10 Global IT systems, 180 Regional Systems, and over 1800 local systems with over 35,000 PCs. There are a single unified Function with three key sub-functions: The support functions (HR, Finance, Legal) along with Strategy, Planning & Transformation provide support services to the other sub-functions.

IT KPIs

These are the draft set of Key Performance Indicators (KPIs) we will use to measure the performance of the Function. We aim to measure these in Q3 2010 and will roll-out fully in 2011.

KPI Metric	Description
IT Cost per User	***Value Driver : Productivity*** A measure of total IT P&L cost divided by the number of IT users – an indicator of overall efficiency of IT when compared to other organisations
IT Reputation *(% Senior Stakeholders scoring at or above agreed Target)*	***Value Driver : Responsibility*** A measure of customer (i.e. Business) satisfaction with all aspects of IT as measured through interview & survey conducted as part of the Quarterly Account Plan review. Score is 1-4 and is a qualitative assessment of delivery against account plan vs expectations
Applications per 1000 Users	***Value Driver : Productivity*** A measure of the number of applications we support per 1000 users – an indicator of how effective we are in designing, deploying and migrating users to fewer global systems

IT Incidents per User	***Value Driver : Productivity*** A measure of the number of recorded Service D esk incidents in a month divided by the number of IT users – an indicator of IT Delivery & Service quality and availability.
% Projects Delivered to Time,Budget & Scope	***Value Driver : Productivity*** Only applicable to IT component of projects. Design-Build-Test plan (inc agreed changes) vs actual
People *(% of our People with Talent Capabilities meeting our Requirements)*	***Value Driver : Winning Organisation*** A measure of the % of our people that meet the required Technical capabilities based on our requirements.
IT Investment Forecast Accuracy	***Value Driver: Productivity*** A measure of how accurate the IT Investment (money & resources) forecast is as measured as a % variance to actuals during a financial year. Measured each quarter through the QPR cycle
Business Value Enabled	***Value Driver : Productivity*** Demonstrate how IT gives Business Value through IT investments made in Business projects and their associated Benefits Realisation

1.5 Hypotheses

There are three hypotheses that will explain the above discussion:

i. There is positive relationship between employee's and management towards different level of understanding of technological innovation awareness in BAT GSDKL Sdn Bhd.

ii. There is positive relationship between employee's and management towards different level of understanding of technological innovation practise in BAT GSDKL Sdn Bhd.

iii. There is a significant difference between gender, age, position, tenure, skills, and academic level in terms of level of understanding of technological innovation awareness in BAT GSDKL Sdn Bhd.

1.6 Significant of the Study

This study is significant to employees of BAT GSDKL Bhd Sdn to know the different level of understanding towards technology and innovation management awareness and practice.

i. The result of this research can be used to provide a useful guide to the employees to improve their awareness.

ii. The result of the study will contribute much to the enhancement of the technological and innovation management practise in the organization BAT GSDKL Bhd Sdn further.

iii. The result of this research would provide the insight and valuable reference specifically to this company regarding technology and innovation management awareness and practice.

iv. Finally, this study would be equally useful reference for academics in universities, college, and the future researcher, who are interested in studying the technology and innovation practise at their workplace. This research will also open their minds and view in a strong passion, commitment, beliefs and wider understanding of the topic.

1.7 Scope of the Study

To achieve the research objectives, the scope of the study will be focused on several components identified as technological innovation management awareness & practice, its location, population sample, and the level of employees practice towards managing technological innovation are as follows:

i. Research is confined at BAT GSDKL Bhd Sdn based in Kuala Lumpur.

ii. The research is only used by BAT GSDKL Bhd Sdn and not by other staff from others BAT subsidiaries.

iii. The samples of respondents in this study comprised of the employees different level of job grade and function in BAT GSD Sdn Bhd. The employees consist from local management to the senior leadership team management level.

iv. The researcher is using the Technology Audit Model as the basis and reference. TAM model has been proven and widely used in previous research guidance. The Technology audit model (TAM), developed by Garcia - Arreola in 1996, is supportive in sense of determining current technological status, surviving areas of opportunity, and taking advantage of the company's strongest capabilities (Khalil 2000).

1.8 Limitation of the study

This study will focus on the technology management practise at BAT GSDKL Sdn Bhd. Hence, this research only focused on studying there are several limitations among the employees.

i. This study only focuses on the permanent employee's located at BAT GSDKL Sdn Bhd at Technology Park Malaysia, Bukit Jalil, Kuala Lumpur.

ii. The impact is that the research result will not represent the overall level of staff in BAT GSDKL Sdn Bhd.

iii. This research does not involve other outsourcing companies and other provider contractors. Only the BAT GSDKL Sdn Bhd was chosen for the purpose of this research.

iv. This research does not involve employees from BAT Globe House (UK) Holding and BAT Malaysia Berhad. Only respondents from BAT GSDKL Sdn Bhd employees based in Kuala Lumpur, Malaysia were chosen for the purpose of this research. The sample of this research is the Simple Random Sampling where all 150 employees and 3 employees' experts from top management were tasked to answer the distributed questionnaires and interview session.

1.9 Conceptual and Operational Definitions

Technology can be defined as theoretical & practical knowledge and skills which can be used MOT ≡ Knowledge management ≡ technological capabilities of the company. In respect of that, technological capability of the company is the ability to effectively and successfully exploit the Management of Technology knowledge. Technological capability has a strategic impact on company's competitive position in its business environment. With the increasing complexity of the business environment, MOT focuses more and more on managing the processes and employees who are involved with them (Thamhain, 2005). The culture of an organisation may be a contributing factor in the extent to which creativity and innovation occur in an organisation (Johnson, 1996; Judge et al.,1997; Pienaar, 1994; Shaughnessy, 1988; Tesluk et al.,

1997; Tushman and O'Reilly,1997). The current organisational culture and the demands of creativity and innovation may lead to a conflict situation. The following terms are conceptually and operational defined in this study:

I. Employees' perceptions toward technology and innovation practise in the company. Understanding and perceptions of the environment act as guiding mechanisms. The practices and procedures that come to define these perceptions are labeled climate. (Scheider, 1996).

   In this study innovation is linked and refers to level of employees' entities at the organising: processes, relationships, commitment and belonging. Resulted in nemurous inventions of a wide variety that help employees' and organisation to work effectively to manage technology and innovation in the company.

II. High achievers spend a lot of time thinking about how to do a job better or how to achieve something important. Timmons (1991, p. 193) comments that this fact could be explained as a continuous struggle between a person and certain self-imposed standards. The organisation system model explains the interaction between the organisational sub- systems (goals, structure, management, technology and psycho-sociology).

This complex interaction, which takes place on different levels, between individuals and groups within the organisation, and with other organisations and the external environment, can be seen as the primary determinant of behaviour in the workplace. The patterns of interaction between people, roles, technology and the external environment represent a complex environment which influences behaviour in organisations.

III. Innovation is holistic in nature. It covers the entire range of activities necessary to provide value to customers and a satisfactory return to the

business. As Buckler (1997) suggests, innovation "is an environment, a culture almost spiritual force – that exists in a company" and drives value creation. Innovation maybe viewed as three fairly distinct phases which are often viewed to be sequen-tial but in reality are iterative and often run concurrently.

In this study technological innovation refers to the value add of the end product or service to its customers directly, and technological innovation improves the work process of creating, developing, producing, delivering and servicing the product.

IV. Organizational culture seems to be a critical factor in the success of any organisation. Successful organisations have the capacity to absorb innovation into the organisational culture and management processes (Syrett and Lammiman, Tuchman and O'Reilly, 1997).

In this study, consistency is a cultural trait that is positively related to effectiveness of technology and innovation practise in the company. Consistency has both positive and negative organisational consequences. The positive influence of consistency is that it provides integration and co ordination. The technological culture refers to the organisation adaptation to practise the technological and innovations. Resulted in a set of shares beliefs, behaviors, assumptions, values and artifacts that a organisation develops as it learns to cope with the external and internal aspects of survival and success.

REFERENCES

Adams, D.A., R.R Nelson and P.A.Todd. (1992). Perceives Usefulness, Ease of Use, and Usage of Information Technology: A Replication. *MIS Quarterly*. Vol. 16(2). 227-247.

Agarwal, R., Prasad, J. (1997). The Role of Innovation Characteristics and Perceived Voluntariness in the Acceptance of Information Technologies. *Decision Sciences*. Vol. 28(3). 557-582.

Aw Wai Yan, Khalil Md Noor, Emad Abu-Shanab and Janeijira. (2009). Factors that Affect Mobile Telephone Users to Use Mobile Payment Solution. *International Journal of Economics and Management*. Vol. 3(1). 37-49.

Azjen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl, & J. Beckmann (Eds.), *Action control: From cognition to behavior* (pp. 11-39). New York: Springer-Verlag.

Ajzen, I., and Fishbein, M. (1980). *Understanding Attitudes and Predicting Social Behavior*. Englewood Cliffs, NJ: Prentice-Hall.

Ajzen, I. (1991). *The Theory of Planned Behavior*. Organization Behavior and Human Decision Processes, page. 50, 179-211.

Burton-Jones, A and G. S. Hubona (2005). Individual Differences and Usage Behavior: Revisiting a Technology Acceptance Model Assumption. *The DATA BASE for Advances in Information Systems*. Vol. 36(2). 58-77.

Brancheau, J., & Wetherby, J. (1990). The adoption of spreadsheet software: Testing innovation diffusion theory in the context of end-user computing. *Information Systems Research*, Vol. 1. 115-143.

Byung Gon Kim, Soon Chang Park, and Kyoung Jun Lee. (2007). A structural equation modeling of the Internet acceptance in Korea. *Electronic Commerce Research and Applications*. Vol. 6. 425-432.

Campeau, D.R. and Higgins, C.A. (1995). Computer Self-Efficacy: Development of a Measure and Initial Test. *MIS Quarterly*. Volume 19(2). 189-211.

Cerveny, R. P., and Sanders, G. L. (1986). Implementation and structural variables. *Information and Management*. Vol. 11. 191-198.

Davis, F.D, Bagozzi, Ricard P. and Warshaw, P.R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Model. *Management Science*. Vol. 35(8). 982-1003.

Erik M. van Raaij and Jeroen J.L. Schepers. (2008). The acceptance and use of a virtual learning environment (VLE) in China. *Computers & Education*. Vol. 50. 838-852.

Feng-Cheng, Tung, and Su-Chao Chang. (2008). Nursing students' behavioural intention to use online courses: A questionnaire survey. *International Journal of Nursing Studies*. Vol. 45. 1299-1309.

Fishbein, M., & Azjen, I. (1975). Belief, attitude, intentions, and behavior: An introduction to theory and research. Reading, MA: Addison-Wesley. 80

Fuerst, W., & Cheney, P. (1982). Factors affecting the perceived utilization of computer-based decision support systems in the oil industry. *Decision Sciences*. Vol. 13. 554-569.

Eardley, A, Lewis, T, Avison, D and Powell, P (1996). The Linkage Between IT and Business Strategy in Competitive Systems: A Reappraisal of some Classic Cases Using a Competition Analysis Framework, International Journal of Technology Management, 11, 3 / 4, 395-411.

Grover, V, Gosler, M and Segars, A (1995). Adopters of Telecommunications Initiatives: The Strategic Usefulness of Management information as Perceived by Middle Managers, Journal of Management, 21, 2, 231-250. Miles, R E and Snow, C C (1978). Organizational Strategy, Structure and Process, New York: McGraHill.

Mintzberg, H (1987). The Strategy Concept, California Management Review, Fall, 11-32.

Osborne, R L (1992). Information and Power in the Private Company, Journal of General Management, 3, 5, 45-49. Parsons, G L (1983). Information Technology

Jaafar Muhammad. *Kelakuan Organisasi. Edisi Ketiga*, Kuala Lumpur: Leeds Publications. 1999.

Jacobs, F.R., Whybark, D.C. (2000). Why ERP? A Primer on SAP Implementation. New York: Irwin McGraw-Hill.

Judy E. Scott and Steven Walczak. (2009). Cognitive engagement with a multimedia ERP training tool: Assessing computer self-efficacy (CSE) and technology acceptance. *Information & Management*. Vol. 46. 221-232.

Karahanna, E., & Straub, D. W. (1999). The psychological origins of perceived usefulness and ease of use. *Information and Management.* Vol. 35. 237-250.

Karahanna, E., Straub, D. W., & Chervany, N. L. (1999). Information technology adoption across time: A cross-sectional comparison of pre-adoption and post-adoption beliefs. *MIS Quarterly*. Vol. 23. 183-213.

Khalil Md Nor and Pearson, J.M. (2007). The influence of Trust on Internet Banking Acceptance. *Journal of Internet Banking and Commerce*. Vol.12(2). 1-10. 82 MASTIC (2006) *National Survey of Innovation: 2002 2004*, Malaysia, MOSTI.

Mathieson, K. (1991). Predicting user intention: Comparing the technology acceptance model with theory of planned behavior. *Information Systems Research*. Vol. 2. 173-191.

Mathieson, K., and Keil, M. (1998). Beyond the interface: Ease of use and task-technology fit. *Information and Management*. Vol. 34. 221-230.

Mathieson, K., Peacock, E., and Chin, W. W. (2001). Extending the technology acceptance model: The influence of perceived user resources. *Database for Advances in Information Systems*. Vol. 32. 86-112.

Moore, G. C., and Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*. Vol. 2. 192-222. 83

Murugan Anandarajan, Magid Igbaria, and Uzoamaka P.Anakwe. (2000). Technology Acceptance in the Banking Industry, *Information Technology & People*. Vol. 23(6). 587-605.

Murch, R. (2001). Project Management - Best Practices for IT Professionals. New Jersey:Prentice-Hall Inc.

Meredith, J.R., & Shafer, S.M. (1999). Operations Management for MBAs. Chichester: John Wiley & Sons, Inc.

Malone, T.W., J. Yates and R.I. Benjamin (1987). 'Electronic markets and electronic hierarchies,'*Communications of the ACM*, 30(6), 484-487.

Powell, W.W. (1990), 'Neither market nor hierarchy: Network forms of organization,' in B.M.. O'Reilly, C. H. (1982). Variations in decision makers' use of information sources: The impact of quality and accessibility of information. *The Academy of Management Journal*. Vol. 25. 756-771.

Ping Zhan, Na Li, and Heshan Sun. (2006). Affective Quality and Cognitive Absorption: Extending Technology Acceptance Research. Hawaii International Conference on System Sciences. January, 2006.

Radner, R., & Rothschild, M. (1975). On the allocation of effort. *Journal of Economic Theory*. Vol. 10. 358-376.

Rahim Abdullah. *Asas Pengurusan, Siri Pengurusan dan Pentadbiran Utusan*. Kuala Lumpur: Utusan Publication and Distributors Sdn Bhd. 2001.

Raymond A, and Ernest Jordan. (2008). Top management support: Mantra or necessity.

Ruth C. King, and Michele L. Gribbins. (2002). Internet Technology Adoption as an Organizational Event: An Exploratory Study Across Industries. *35th Hawaii International Conference on System Sciences*. January, 2002.

Said S. Al-Gahtani, and Malcom King. (2006). Attitudes, Satisfaction and Usage: Factors Contributing to Each in the Acceptance of Information Technology. *Behavior & Information Technology*. Vol. 18(4). 227-297.

Salkind Neil J. Exploring Research, Seventh Edition. U.S.A: Pearson International Edition. 2009.

Salvador Bueno and Jose L. Salmeron. (2008). TAM-based success modeling in ERP. *Interacting with Computers*. Vol. 20. 515-523.

Samuel B. and Neil J. Salkind. Using SPSS for windows and Macintosh. Fifth Edition. Pearson Education International. 2008.

Sandy Behrens, Kieren Jamieson, David Jones, and Mary Cranston. (2005). Predicting System Success Using the Technology Acceptance Model: A Case Study. *16th Australasian Conference on Information Systems Predicting Success Using TAM*. December, 2005.

Schumpter, J. (1934) Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest and the Business Cycle. Boston, MA: Harvard University Press.

Sekaran, U. (2003) Research Methods for Business: A Skill-Building Approach, John Wilney & Sons, Inc.

Sekaran, U. *Research Methods for Business: A skill building approach*. New York, N.Y.: John Wiley and Sons. 2003.

Smith D. (2006) "Exploring Innovation" The McGraw-Hill Companies.

Sokura, Tuunainen, and Oorni. (2009). The role of training in decreasing anxiety among experienced computer users. *17th European Conference on Information Systems*. 2009. 85 Solomon Negash, Terry Ryan and, Magid

Igbaria. (2003). Quality and effectiveness in Web-based customer support systems. *Information & Management*. Vol. 40(2003). 757-768.

Srite, Mark and Karahanna, Elena. (2006). The Role of Espoused National Cultural Values in Technology Acceptance. *MIS Quarterly*. Vol. 30(3). 679-704.

Taylor, S. and Todd, P.A. (1995). Understanding information technology usage: a test of competing models. *Information System Research*. Vol. 6(2). 144-176.

T. Ramayah and Muhammad Jantan (2004). Technology Acceptance: An individual perspective current and future research in Malaysia. *Review of Business Research*. Vol. 2(1). 103-111.

Thamhain H.J. (1996) "*Managing Technology-Based Innovation*", G.H. Gaynor (ed.), Handbook of Technology Management. New York, McGraw-Hill.

Trott, P. (2002) *Innovation Management and New Product Development*, 2 edition, Gosport, Perason Education.

Tero Pikkarainen, Kari Pikkarainen, Heikki Karjaluoto, and Seppo Pahnila. (2004). Consumer Acceptance of Online Banking: An Extension of the Technology Acceptance Model. *Internet Research*, Vol. 14(3). 224-235.

Tchokogue, A., Bareil, C., Duguay, C.R. (2005). Key lessons from the implementation of an ERP at Pratt & Whitney Canada. *International Journal of Production Economics*. Vol. 95(2). 151-163.

Tornatzky, L. G., and Klein, J. (1982). Innovation characteristics and innovation adoption-implementation: A meta-analysis of findings. *IEEE Transactions on Engineering Management*. Vol. 29. 28-45. 86

Van der Heijden, H. (2003). Factors influencing the usage of websites: The case of a generic portal in the Netherlands. *Information and Management*. Vol. 40.

Vassilios P. Aggelidis and Prodromos D. Chatzoglou. (2009). Using a modified technology acceptance model in hospitals. *International journal of medical informatics*. Vol. 78. 115-126.

Venkatesh, V. (2000). Determinants of Perceived Ease of Use: Integration Control, Intrinsic Motivation and Emotion Into Technology Acceptance Model. *Information System Research*. Vol. 4(4). 342-365.

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

Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*. Vol. 27(3). 425- 478.Venkatesh, V. and Ramesh, V. (2006). Web and Wireless Site Usability: Understanding Differences and Modeling Use. *MIS Quarterly*. Vol. 30. 181-206.

Xavier, M. J., Ramachander, S., (2000) "The Pursuit of Immortality: a new approach beyond the competitiveness paradigm" *Academy for Management Excellence, Chennai, India.*

Zikmund, W.G. (1997) *"Business Research Method*", 5th ed. The Dryden Press.

Ziman, H. (1991) "*A Neural Model of Innovation, Science, and Public Policy*" vol. 18, February, pp. 65-75.

Zakaria Z. (1999) *"Statistic Management"*, University Utara Malaysia.