

# The Relationship among Organizational Culture, Leadership Style, Information and Communication Technology and Organization Efficiency

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**Abstract**—The objective of a firm is to maximize wealth for stakeholders and to manage the relationship between leadership and technology, which is the key to developing and increasing organization efficiency.

While balanced scorecards are used in many corporations to evaluate performance, Information and Communication Technology (ICT) is widely used in organizations to increase competitive advantage and differentiate from competitors.

This research provides factors which enable organizations to understand the importance of ICT and best utilize it to support their business. Therefore, organizational culture and leadership are the primary focal points of this research.

A questionnaire was developed to collect information about the relationship among culture, leadership, ICT and organization efficiency. This research adopts multiple linear regressions as a statistical tool to analyse the collected data. The results shown that culture and leadership have no direct impact on ICT, but ICT impacts organization efficiency.

**Keywords**—Information and Communication Technology (ICT), Leadership style, Organization culture, Organization efficiency

## I. Introduction

Information and Communication Technology (ICT) is developing at groundbreaking speed. At the same time, a globalized economy has made organizations aware and concerned about the need to improve their efficiency. ICT is becoming the principal instrument for solving this concern [1]. Business sectors always seek to use ICT to increase efficiency and gain competitive advantage for their organizations [2] [3].

ICT has been used in many businesses and industries and in different ways, depending on the business needs, such as understanding customer needs and providing customer satisfaction [3] [4].

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It is important to note that using ICT in different businesses has an impact on business key performance indicators (KPI). One of the most widely used KPI that many organizations pay attention to is learning and growth perspective, which is claimed to be the initiation point that impacts other perspectives [5].

To make ICT implementation a success, people in organizations have to be aware that ICT projects cannot transform the organization by themselves [1]. With reference to people in an organization, specific company culture, although invisible, has a significant impact on it [6] [7]. As [8] pointed out in their book, *Corporate Culture*, culture is a norm which comes from people in organizations. Another major factor that impacts culture is leadership [9].

This research will discover the answer to the question: “Are there any relationships and impact among organizational culture, leadership style, ICT and organization efficiency and how do they impact each other?” The outcome of this study will be one of many key parameters that help business decision-makers or strategic partners to identify and to drive their organization’s direction.

## II. Literature Review

### A. Organization Efficiency

In the past, only financial results are used for corporate performance evaluation. However, when considering the key financial factors, such as profit and loss, cash flow and financial statements, they inform us only of past events, but cannot predict the future.

Kaplan and Norton developed a new tool called Balanced Scorecards (BSC) which separates Key Performance Indicators (KPI) into financial, customer, business process/internal operation, and learning and growth perspectives to help managers or decision-makers to understand the current status of their organization [10]. KPI, in these four dimensions, also has the capability to adjust and adapt to each organization’s goal and strategy [11].

Although the financial dimension is important, customer aspect remains the key factor that leads direction to develop products and services. In addition, the internal operation aspect creates a company’s product or service value which differentiates it from its competitors. However, the learning and growth factor is also the critical point of these dimensions and identifies the core competencies and skills of organizations [5]. From this perspective, this research will focus on learning and growth capabilities that help

organizations to continue improving and developing themselves to achieve their organization vision and goal [11]. The foundation of an organization strategy map in the learning and growth perspective consists of three core competencies, namely: Skill, Technologies, Culture [5].

The level of learning within organizations can represent implications for the level of learning and growth. When considering the components of Learning organization development, namely, Continuous Learning, Inquiry and Dialogue, Collaboration and Team Learning, Systems Creation, People Empowerment, Connecting the Organization and Strategic Leadership [12], these is a evidence shows that they are also related to employee development competencies, and skills and systems that support business needs.

## B. Information and Communication Technology

[13] stated in *The Third Wave* that the next wave after the industrial era will be the information era. This reinforces what we now know that information and communication technology is a vital organ within an organization.

Many researchers have said that the importance of information is increasing and becoming an urgent issue [14]. An organization that has high levels of ICT competencies will possess more competitive advantages to lead the market [14].

ICT Competencies not only help organizations to understand and use technology, but also make organizations to know the necessary processes of managing market information and customer information. We can identify ICT competencies in three areas, as follows:

IT Knowledge: defined as “a set of principles and techniques useful to bring about change towards desired ends” [14].

IT Operations: used to measure how organizations utilize ICT to manage information relevant to their customer and market information. This also proves that an organization not only has IT Knowledge, but can also, and importantly, turn its knowledge into action.

IT Objects: present the existence of technology in the organization in terms of computer-based software, hardware and support personnel [14].

## C. Organizational Culture

During the last decade, many empirical researchers have tried to connect and seek the relationship between organization culture and corporate performance. In the past, business people ignored the influence of culture on their business and believed they could not manage the culture in their organization.

Organizational culture values, widely researched and used, were developed based on Competing Values Framework [7] [15] [16] [17] [18] [19] [20] [21]. They comprise two 2 dimensions, the first dimension representing the condition of corporate strategy that focuses on internal or external dimensions. Another dimension presenting the management of

organizational environment that focuses on flexibility and individuality, or focuses more on stability and control.

These two dimensions can create the following four dominant cultures:

Clan culture: an extended family working style in which everyone shares himself or herself. Loyalty and tradition are the keys that hold this organization together.

Adhocracy culture: the dynamic, creative and entrepreneurial work environment. Everyone is willing to take risks. They also have an innovative mind-set and always commit to experimentation for innovation.

Hierarchy culture: a company’s culture has a much formalized and strictly structured form where formal rules and policies bind the organization. It is also related to stability and performance.

Market culture: result-oriented management is the phase that describes this working style. Reputation, success and winning are common concerns [7].

Each culture has dominant characteristics; a strong culture can result in competitive advantages for an organization. We can conclude that Culture is the key factor that drives the efficiency of organizations [16].

## D. Leadership Style

[22] pointed out that leadership has no influence on an organization’s effectiveness. This is in contrast to the existing significant effects of leaderships in organizations, as agreed and acknowledged by several practitioners and researchers [23] [24] [25].

However, it is important to consider what the dominant characteristics of organizations are. Competing Value Framework (CVF) is not only applied to create a framework for organization culture, but also used as a base idea of the leadership role which leaders or management level employees should consider and apply.

The eight Leadership styles mentioned by CVF are: Director, Producer, Monitor, Coordinator, Facilitator, Mentor, Innovator, Broker [9]. These styles were used in the research in order to identify proper leadership styles, especially the transformational leader, who has vision and skill to create, and can inspire and increase the effective mind-set of followers [26].

## III. Research Hypothesis

From many researches, there is a relationship between culture and the usage of enterprise resources planning (ERP) - [27] [28] [29]. It is also significant to record that we considered IT competency which represents the big picture of ICT in an organization [14].

However, the question “**Is culture still related to ICT or not and how do they related?**” comes to mind. From this viewpoint, it has been assumed that organization culture has an impact on Information and Communication Technology (H1). In relation to culture, leadership is a significant factor of

organization culture and should be included [9]. It is also interesting that leadership has an impact on ICT (H2).

The development of information systems in an organization is now a significant challenge to management. Development and deployment of information systems might affect the current operational task processes, or result in changes to organization behaviour which can lead an organization to increase competitive advantage and the working efficiency of workers [2] [30]. From this concept, it is important to research whether or not ICT will impact organization efficiency in the learning and growth perspective (H3).

Referring to [31], which reviewed 82 researches relating to culture and technology, it shown that most of them gave attention to identifying the culture that impacts user satisfaction and the success of ICT usage in organizations.

Many of the researchers studied the link between culture and the success of knowledge management (KM). In the real world, people in organizations are not willing to share that special knowledge as this can lead to loss of security and identify, above others; management should address this matter [32]. From the above assumptions, proper culture and leadership should have an impact on ICT and the organization efficiency within the dimension of learning and growth (H4)

#### IV. Data Analysis and Finding

After A questionnaire was developed based on various sources of research [7] [12] [14]; this has passed validity and reliability tests using Cronbach's Alpha Coefficient. This research also adopts multiple variable regression and descriptive statistics with R, to be explained.

The questionnaire was sent to companies across industries in Bangkok and targeted to staff at managerial, or higher, positions. Responses from 32 companies were received within one month, of which 25% were from companies listed on the Stock Exchange of Thailand (SET); the remainder were from Small and Medium Enterprises (SMEs). Respondent characteristics as follows:

- **Position:** 174 supervisors, managers or higher-level staff.
- **Age:** Distributed in a normal curve shift, from 31 – 50 years old.
- **Gender:** 74 = male; 100 = female.
- **Education:** Levels were: Ph.D. = 1; M.A. = 93; B.A. = 79; High Vocational Certificate = 1.

These samples are good representative for this study.

From the research, Culture and Leadership have no direct impact on ICT, while from the descriptive statistic show that most of the organizations have Clan (40.63%) and Market (37.50%) culture types. Only 4 types of leadership - Mentor (56.25%), Facilitator (28.13%), Coordinator (9.38%) and Innovator (6.25%) are presented at Organization level. However, if we more thoroughly analyse each response, 42.53% of respondents have a Mentor type, which is a reasonable statistic given the theory of culture and leadership based on CVF [7].

Comparing the status of ICT competencies, on average, between SET-listed companies and SME-listed company the result shows that SET-Listed companies has no different with SME. Comparing between SET-listed companies and SME-listed companies the result shows that SET-Listed companies has more capabilities in the ICT Object than SME companies. However, all ICT competencies are above average, as displayed in Table I.

Results from regression, which indicated that only ICT has an impact on organization efficiency, were accepted (H3), with a residual standard error = 0.424 on 30 degrees of freedom; Multiple R-squared = 0.2115; Adjusted R-squared = 0.1852; F-statistic: 8.046 on 1 and 30 DF; p-value: 0.008094. Coefficient details are displayed in the following Table II. H1, H2 and H4 were rejected.

Looking at Hypothesis 3 (H3) more in details, the results from multiple linear regression analysis show that only ICT Operation has no direct impact on Finance, but has impact on Knowledge Performance and Organization Learning. For details, see Table III.

TABLE I. ICT COMPETENCIES STATUS.

Business Sector	Average ICT competencies (Score: 1 - 7)			
	ICT Knowledge	ICT Operation	ICT Object	ICT Competencies
SET	5.14	5.27	5.77	5.39
SME	5.32	5.20	5.49	5.34

TABLE II. COEFFICIENTS AT 0.01 ARE A SIGNIFICANT LEVEL WHEN ORGANIZATION EFFICIENCY IS A DEPENDENT VARIABLE.

	Estimate	Std. Error	T	Sig
(Intercept)	2.1387	0.7312	2.925	0.00651
ICT Competencies	0.3857	0.1360	2.837	0.00809

TABLE III. STATISTICAL RESULTS USING MULTIPLE REGRESSION METHOD

Dependent Variable	Independent Variable	R squared	Adjusted R squared	F	Estimate	Std. Error	T	Sig
Organization Learning	ICT Operation	0.1861	0.159	6.86	2.687	1.026	2.619	0.01369
Knowledge Performance	ICT Operation	0.0097	0.06969	3.322	0.2815	0.1545	1.823	0.07834

## v. Discussion and Concern

Although Culture has no direct impact on ICT Competencies, based on the literature reviews [27] [28] [29]. It is important to note if different measurement of cultures which might have difference culture type component, i.e. Hofstede's culture dimension, might impact ICT Competencies. Similarly, Leadership style has no direct impact on ICT Competencies. From this position, it is reasonable to state that Leadership style has a close relationship with Culture, as mentioned earlier in review [9]. However, it is possible that Leadership style might be a factor which will be a part of ICT usage. Researchers could continue to investigate this further.

The evidence from study found that Information and Communication Technology has a direct impact on Organization Efficiency, as stated in review [2] [30]. ICT Operations, especially, have more impact than both ICT Object and ICT Knowledge which implies gains in efficiency of organization in Learning and Growth.

From these findings, decision-makers should consider how to drive ICT usage, i.e. ICT departments should encourage and empower users in organizations to have capabilities in collecting, processing, analysing and archiving customer or market information. In the analysis, and from the size of the organizations analysed, it was found that there is no difference between organizations listed and unlisted on the SET. Consequently, it is implied that the results can apply to any size of organization.

This research includes various types of organizations as the researcher collected data from companies across industries. However, most respondents are from companies in the Consumption, Finance and Technology sectors. It would be valuable to repeat this research and obtain a larger number of responses from other business sectors to discover, explore and confirm the relationships and its impact in other business areas. In addition, any future research could be expanded to include other relevant factors. A questionnaire was developed based on various sources of research. Although Culture has no direct impact on ICT Competencies, based on the literature reviews [27] [28] [29].

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## References

- [1] Y. C. Gagnon and J. Dragon, "The impact of technology on organizational performance," *Optimum: The Journal of Public Sector Management*, vol. 28, no. 1, pp. 19-31, 1998.
- [2] M. E. Porter and V. E. Milla, "How information give you competitive advantage," *Harvard Business Review*, vol. 63, no. 4, pp. 149-160, 1985.
- [3] W. Paenpluem and N. Thammakoranonta, "The Relationship between Information and Communication Technologies Adoption and Management in Thai's Business Organization," *International Proceedings of Economics Development and Research (IPEDR)*, vol. 43, pp. 57-61, 2012.
- [4] S. Khurram, "Impact of information and communication technologies on sales representative internal and external relationships - A study of the UK pharmaceutical sector," *Journal of Medical Marketing*, vol. 8, no. 4, pp. 341-355, 2008.
- [5] R. S. Kaplan and D. P. Norton, "Having Trouble with your Strategy? Then Map It.," *Harvard Business Review*, vol. 78, no. 5, pp. 167-176, 2000.
- [6] J. A. Chatman and K. A. Jehn, "Assessing the relationship between industry characteristics and organizational culture: how different can you be?," *Academy of Management Journal*, vol. 37, no. 3, pp. 522-553, June 1994.
- [7] K. S. Cameron and R. E. Quinn, *Diagnosing and Changing organization culture: based on the competing values framework*, Sanfrancisco, CA: Jossey-Bass, 2006.
- [8] A. A. Kennedy and T. E. Deal, *Corporate culture: The rites and rituals of corporate life*, New York: Addison Wesley Publication, 1982.
- [9] F. A. Mozaffari, "A Study of Relationship between Organizational Culture and Leadership," in *International Conference on Applied Economics - ICOAE, Kastoria - Greece*, 2008.
- [10] R. S. Kaplan and D. P. Norton, "The Balanced Scorecard - Measures that Drive Performance," *Harvard Business Review*, Vols. January - February, pp. 71-79, 1992.
- [11] R. S. Kaplan and D. P. Norton, "Putting the Balanced Scorecard to Work," *Harvard Business Review*, Vols. September - October, pp. 134-147, 1993.
- [12] V. Marsick and K. Watkins, "Demonstrating the value of an organization's learning culture: The dimension o the learning organization questionnaire," *Advance in Developing Human Resources*, vol. 5, no. 2, pp. 132-151, 2003.
- [13] A. Toffler, *The Third Wave*, New York: William Morrow, 1980.
- [14] M. J. Tippins and R. S. Sohi, "IT COMPETENCY AND FIRM

- PERFORMANCE: IS ORGANIZATIONAL LEARNING A MISSING LINK?," Strategic Management Journal, vol. 24, pp. 745-761, 2003.
- [15] S. A. Dellana and R. D. Hauser, "Toward Defining the Quality Culture," Engineering Management Journal, vol. 11, no. 2, pp. 11-15, 1999.
- [16] D. R. Denison, Corporate culture and organization effectiveness, New York: John Wiley & Son, 1990.
- [17] D. R. Denison and G. M. Spreitzer, "Organizational Culture and Organizational Development: A Competing Values Approach," Research in Organizational Change and Development, vol. 5, pp. 1-21, 1991.
- [18] C. Demir, N. A. A. Unnu and E. Erturk, "Diagnosing the Organizational Culture of a Turkish Pharmaceutical Company Based on the Competing Values Framework," Journal of Business Economics and Management, vol. 12, no. 1, pp. 197-217, 2011.
- [19] S. O. Harris and K. W. Mossholder, "The Affective Implications of Perceived Congruence with Culture Dimensions During Organizational Transformation," Journal of Management, vol. 22, no. 4, pp. 527-547, 1996.
- [20] R. E. Quinn and J. Rohrbaugh, "A Spatial model of effectiveness criteria: Towards a competing value approach to organizational analysis," Management Science, vol. 29, no. 3, pp. 363-377, 1983.
- [21] J. E. Sheridan, "ORGANIZATIONAL CULTURE AND EMPLOYEE RETENTION," Academy of Management Journal, vol. 35, no. 5, pp. 1036-1056, 1992.
- [22] J. R. Meindl and S. B. Ehrlich, "THE ROMANCE OF LEADERSHIP AND THE EVALUATION OF ORGANIZATIONAL PERFORMANCE," Academy Of Management Journal, vol. 30, no. 1, pp. 91-109, 1987.
- [23] D. V. Day and R. G. Lord, "Executive Leadership and Organizational Performance: Suggestions for a New Theory and Methodology," Journal of Management, vol. 14, no. 3, pp. 453-464, 1988.
- [24] R. B. Kaiser, R. Hogan and S. B. Craig, "Leadership and the Fate of Organizations," American Psychologist, vol. 63, pp. 96-110, 2008.
- [25] L. J. Schimmoeller, "Leadership Style in Competing Organizational Culture," Kravis Leadership Institute, Leadership Review, vol. 10, pp. 125-141, 2010.
- [26] E. Ogbonna and L. C. Harris, "Leadership style, Organizational culture and performance: empirical evidence from UK companies," International Journal of Human Resource Management, vol. 11, no. 4 (August), pp. 766-788, 2000.
- [27] P. Ifendodo, "Interactions between organizational size, culture and structure and some IT factors in the context of ERP success Assessment: An Exploratory Investigation," Journal of Computer Information System, vol. 31, no. 1, pp. 28-44, 2007.
- [28] J. Iivari and M. Huisman, "The Relationship between Organizational Culture and The Deployment of Systems Development Methodologies," MIS Quarterly, vol. 31, no. 1, pp. 35-58, 2007.
- [29] M. G. Martinsons, R. Davison and V. Martinsons, "How Culture Influences IT - enabled Organizational Change and Information Systems," Communications Of The ACM, vol. 52, no. 4, pp. 118-123, 2009.
- [30] S. Mithas, A. Tafti, I. Bardhan and J. Mein Goh, "INFORMATION TECHNOLOGY AND FIRM PROFITABILITY: MECHANISMS AND EMPIRICAL EVIDENCE," MIS Quarterly., vol. 36, no. 1, pp. 205-224, 2012.
- [31] D. E. Leidner and T. Kayworth, "REVIEW: A REVIEW OF CULTURE IN INFORMATION SYSTEMS RESEARCH: TOWARD A THEORY OF INFORMATION TECHNOLOGY CULTURE CONFLICT," MIS Quarterly, vol. 30, no. 2, pp. 357-399, 2006.
- [32] K. Ren-Zong and L. Gwo-Guang, "Knowledge management system adoption: exploring the effects of empowering leadership, task-technology fit and compatibility," Behaviour & Information Technology, vol. 30, no. 1, pp. 113-129, 2011.

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