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Knowledge Management And Information Technology Effects On Competitive Advantage And University Performance In Thai Higher Education

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Abstract – This study examines the effects of knowledge management and information technology on competitive advantage and university performance in private higher education institutions in Thailand. A quantitative cross-sectional survey was administered to academic and administrative staff at four institutions. Of 320 questionnaires distributed, 283 valid responses were analyzed using Partial Least Squares Structural Equation Modelling (PLS-SEM). Knowledge management had significant positive effects on competitive advantage and university performance, while competitive advantage also significantly improved university performance. Information technology did not have significant direct effects on either competitive advantage or university performance. The findings indicate that technology functions primarily as an enabling infrastructure, whereas sustainable institutional performance depends on effective knowledge creation, sharing, storage, and application. The study provides evidence from Thai higher education and highlights the importance of integrating digital investment with knowledge-management practices.

Keywords – Knowledge management; information technology; competitive advantage; university performance; higher education

I. INTRODUCTION

Thailand's higher education sector is being reshaped by globalisation, digital transformation, stronger competition, and the Thailand 4.0 agenda. Private universities face particular pressure to improve educational quality, institutional reputation, research productivity, graduate employability, and long-term sustainability. These conditions require the strategic use of intangible organisational resources rather than reliance on physical and financial resources alone.

From the Resource-Based View, knowledge can create sustainable advantage when it is valuable, difficult to imitate, and effectively embedded in organisational routines. Knowledge management (KM) encompasses the creation, acquisition, organisation, storage, sharing, and application of knowledge for improved decision-making and innovation (Khan, 2012; Mills & Smith, 2011). In universities, KM supports academic collaboration, research productivity, organisational learning, and continuous institutional improvement. A culture of trust and knowledge sharing is therefore essential for converting individual expertise into institutional capability (Oliver & Kandadi, 2006; Wang & Wang, 2012).

Information technology (IT) supports knowledge processes through learning-management systems, cloud platforms, digital repositories, institutional databases, artificial intelligence, and data analytics. IT can improve communication and operational efficiency throughout the knowledge-management cycle (Lee & Hong, 2002; Kansal & Sengar, 2011). However, widely available digital infrastructure may become a basic operational requirement rather than a rare strategic resource. Its performance effects may consequently depend on how technology is integrated with organisational knowledge, people, leadership, and institutional strategy.

Competitive advantage in higher education is reflected in reputation, educational quality, research excellence, innovation, international collaboration, industry engagement, graduate employability, and stakeholder satisfaction. Prior research links knowledge management to organisational performance and competitive position (Jamil & Lodhi, 2015; Jasinskas et al., 2015; Zaied et al., 2012), while competitive advantage is expected to strengthen performance through differentiation and resource effectiveness (Li et al., 2006). Based on this literature, the study tests five hypotheses: H1, KM positively affects university performance; H2, KM positively affects competitive advantage; H3, competitive advantage positively affects university performance; H4, IT positively affects competitive advantage; and H5, IT positively affects university performance.

A. Knowledge Management Infrastructure and Processes

Knowledge management infrastructure comprises the human, cultural, and organisational conditions that enable knowledge to be generated and shared. In knowledge-intensive institutions, academic and administrative employees are the principal carriers of intellectual capital. Universities therefore need continuous staff development, collaborative structures, professional networks, and supportive leadership to strengthen the capacity of employees to create and exchange knowledge. Quinn (1992) argued that organisational competitiveness increasingly depends on intellectual rather than

physical capital, a view that is particularly relevant to universities because teaching, research, and service are produced through the expertise of people.

A knowledge-sharing culture provides the values and norms that encourage employees to exchange experience, document lessons, and apply collective expertise. Trust, openness, collaboration, and continuous learning reduce the tendency to retain knowledge within departments or individuals (Oliver & Kandadi, 2006). When these conditions are weak, universities may possess substantial expertise but fail to convert it into coordinated institutional action. Knowledge management is therefore not only a technical process; it also requires incentives, leadership support, and organisational routines that make knowledge sharing part of everyday academic and administrative work.

The processes of knowledge management include acquisition, creation, storage, sharing, and application. Knowledge is acquired through research, academic cooperation, professional development, international partnerships, industry engagement, and feedback from students and other stakeholders (Inkpen & Dinur, 1998). It is stored in databases, repositories, archives, policies, curricula, and organisational memory. Storage alone, however, does not create value. Knowledge contributes to performance when employees can retrieve and apply it to curriculum design, research decisions, service improvement, resource allocation, and institutional problem solving (Nelson & Winter, 2002; Minbaeva et al., 2003).

B. Information Technology as an Enabling Resource

Information technology provides the infrastructure through which knowledge can be captured, communicated, and reused. Learning-management systems support course delivery and learning analytics; institutional databases support admissions and administration; digital repositories preserve research and teaching materials; and cloud services, artificial intelligence, and data analytics enable faster access to information. Lee and Hong (2002) observed that IT supports the entire knowledge-management cycle, while Kansal and Sengar (2011) emphasised the importance of aligning information systems with knowledge processes.

Despite these benefits, technology may not automatically produce superior performance. Digital platforms are increasingly accessible to most higher education institutions and can be acquired by competitors. If systems are fragmented, underused, or disconnected from institutional strategy, they may improve routine efficiency without creating distinctive capabilities. Sustainable advantage is more likely when IT is combined with staff competence, high-quality data, knowledge-sharing culture, process redesign, and leadership commitment. This distinction provides a basis for examining whether IT has direct effects on competitive advantage and university performance in the Thai context.

C. Competitive Advantage and Multidimensional University Performance

Competitive advantage describes an institution's capacity to achieve a stronger position than comparable organisations through resources and capabilities that are difficult to reproduce. In higher education, advantage may be expressed through academic reputation, programme quality, research excellence, innovative teaching, international partnerships, industry links, graduate employability, service responsiveness, and stakeholder satisfaction. Effective KM can support these outcomes by helping universities learn faster, coordinate expertise, and transform experience into improved practice (Carter & Scarbrough, 2001; Jasinskas et al., 2015).

University performance is broader than financial performance. The source study evaluates performance through research productivity, employee commitment, and industry engagement. Research productivity includes publications, grants, patents, and innovation outputs (Flagg et al., 2011). Employee commitment reflects motivation, loyalty, and willingness to contribute to institutional goals (Chen, 2007). Industry engagement includes research collaboration, technology transfer, internships, professional partnerships, and community-oriented activity (Caloghirou et al., 2001). Together, these dimensions capture the educational, research, and societal responsibilities of a university.

D. Research Model

The proposed model treats knowledge management and information technology as exogenous organisational resources, competitive advantage as both an outcome and an explanatory capability, and university performance as the final endogenous construct. The model allows KM and IT to affect performance directly while also examining whether competitive advantage contributes independently to performance. This structure reflects the argument that organisational resources create value when they are transformed into distinctive institutional capabilities.

II. METHOD

The study used a quantitative cross-sectional survey of academic and administrative employees from four selected private higher education institutions in Thailand. The population comprised 1,586 employees, including 1,102 academic staff and 484 administrative staff. A sample of 320 was determined using the Slovin formula with a 5% margin of error, and proportionate sampling was used to represent both staff categories and all participating institutions. Questionnaires were distributed electronically and in printed form; 283 complete questionnaires were returned, producing an 88.4% valid response rate.

All constructs were measured on a five-point Likert scale. Knowledge management was represented by 18 indicators covering knowledge-management infrastructure and the acquisition, storage, sharing, and application of knowledge. Information technology used six indicators; competitive advantage used seven indicators; and university performance used 11 indicators covering research productivity, employee commitment, and industry engagement.

The model was evaluated with PLS-SEM in SmartPLS. The measurement model was assessed through indicator loadings, composite reliability, average variance extracted (AVE), and the Fornell-Larcker criterion. The structural model was assessed using path coefficients, R^2 , effect size, predictive relevance, and bootstrapping. A relationship was considered significant when $t > 1.96$ at the 5% level.

A. Sampling and Data Collection

The participating institutions were selected from the private higher education sector, where competition for students, qualified personnel, research funding, and partnerships is especially intense. Academic respondents included lecturers and researchers, while administrative respondents included personnel involved in academic support, student services, information management, and institutional administration. Both groups were included because they participate in knowledge creation, knowledge use, technology adoption, and organisational decision-making.

Proportionate sampling was used because the institutions and employment categories differed in size. The target of 320 questionnaires was allocated according to the number of employees in each participating institution. Respondents were informed that participation was voluntary and that responses would be used for academic purposes. The 283 complete returns represented 88.4% of the distributed questionnaires and formed the final analytical sample.

B. Construct Operationalisation

Knowledge management was operationalised through knowledge-management infrastructure and knowledge-management processes. The indicators addressed people, culture, knowledge acquisition, storage, sharing, and application. IT indicators assessed the use of digital systems in teaching, administration, communication, and knowledge management. Competitive-advantage indicators assessed the institution's relative capacity to deliver superior value, while university-performance indicators covered research output, employee commitment, and engagement with industry. The instruments were adapted from prior studies and contextualised for Thai higher education.

C. PLS-SEM Evaluation Procedure

PLS-SEM was selected because the research objective was predictive and the model contained multiple latent constructs and simultaneous structural relationships. The outer model was examined first to establish the adequacy of the measures. Composite reliability and Cronbach's alpha values above 0.70 were treated as acceptable, indicator loadings above 0.70 as preferable, and AVE values above 0.50 as evidence of convergent validity. Discriminant validity was assessed through the Fornell-Larcker criterion.

After the measurement model was accepted, the inner model was evaluated using path coefficients, R^2 values, effect sizes, and predictive relevance. Bootstrapping with 5,000 resamples was used to obtain t-statistics. Paths with t-values greater than 1.96 were considered statistically significant at the 5% level. The analysis also compared the explanatory power of KM, IT, and competitive advantage for the two endogenous constructs.

III. RESULTS AND DISCUSSION

A. Respondent Profile and Measurement Model

Among the 283 respondents, 56% were women and 44% were men. Academic staff constituted 69% of the sample and administrative staff 31%. Institutional representation was 48% from University A, 27% from University B, 13% from University C, and 12% from University D. This distribution reflected the proportional allocation of the survey.

TABLE I. RESPONDENT PROFILE

Characteristic	Category	Percentage
Gender	Male	44%
	Female	56%
Employment category	Academic staff	69%
	Administrative staff	31%
Institution	University A	48%
	University B	27%
	University C	13%
	University D	12%

Composite reliability values ranged from 0.8900 to 0.9051, exceeding the recommended 0.70 threshold. The reported AVE values ranged from 0.6534 to 0.7844. The manuscript's Fornell-Larcker matrix also indicated that the constructs were empirically distinguishable. The measurement model was therefore retained for structural testing.

TABLE II. DESCRIPTIVE AND MEASUREMENT-MODEL RESULTS

Construct	N	Reported Mean	Composite Reliability	AVE
Knowledge Management	283	0.6457	0.8903	0.6534
Information Technology	283	0.7491	0.9051	0.7844
Competitive Advantage	283	0.7815	0.9012	0.7537
University Performance	283	0.6798	0.8900	0.6913

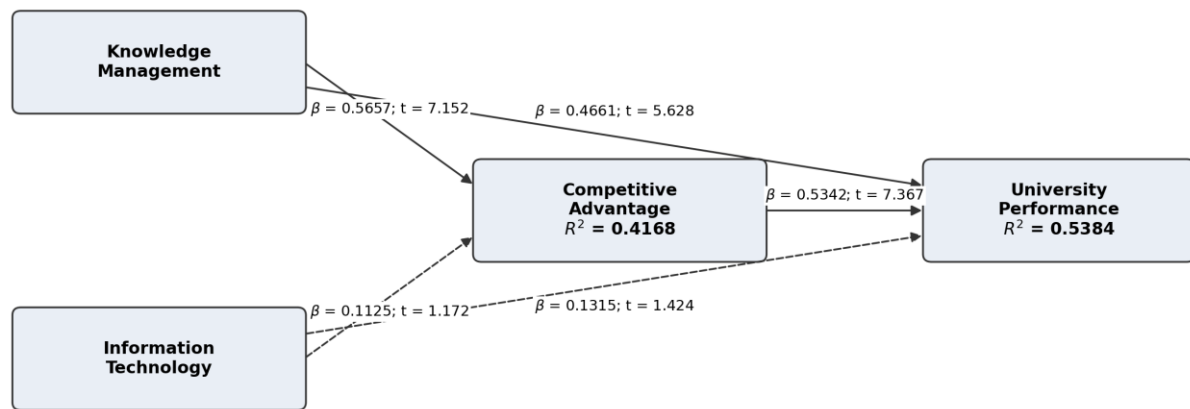
Note. Mean values are reproduced as reported in the source manuscript.

The reported descriptive values showed the highest average score for competitive advantage (0.7815), followed by information technology (0.7491), university performance (0.6798), and knowledge management (0.6457). Knowledge management had the largest reported standard deviation (0.070), suggesting greater variation in respondents' perceptions across institutions, while information technology had the smallest standard deviation (0.054), indicating relatively consistent perceptions of digital infrastructure and use.

The latent-variable matrix reported correlations of 0.6401 between competitive advantage and knowledge management, 0.7030 between competitive advantage and university performance, 0.4864 between competitive advantage and information technology, 0.5927 between knowledge management and university performance, 0.6611 between knowledge management and information technology, and 0.4996 between university performance and information technology. The source manuscript concluded that the diagonal values exceeded the corresponding inter-construct correlations and therefore supported discriminant validity.

B. Structural Model and Hypothesis Testing

The model explained 41.68% of the variance in competitive advantage and 53.84% of the variance in university performance, indicating moderate explanatory power. Knowledge management significantly predicted university performance ($\beta = 0.4661$; $t = 5.628$) and competitive advantage ($\beta = 0.5657$; $t = 7.152$). Competitive advantage significantly predicted university performance ($\beta = 0.5342$; $t = 7.367$). In contrast, information technology did not significantly predict competitive advantage ($\beta = 0.1125$; $t = 1.172$) or university performance ($\beta = 0.1315$; $t = 1.424$). Thus, H1-H3 were supported, while H4 and H5 were not supported.



Solid paths are significant at $p < 0.05$; dashed paths are not significant.

Fig. 1. Structural model results
TABLE III. HYPOTHESIS TESTING

Hyp.	Path	β	t	Critical t	Decision
H1	KM $\rightarrow$ University Performance	0.4661	5.628	1.96	Supported
H2	KM $\rightarrow$ Competitive Advantage	0.5657	7.152	1.96	Supported
H3	Competitive Advantage $\rightarrow$ University Performance	0.5342	7.367	1.96	Supported
H4	IT $\rightarrow$ Competitive Advantage	0.1125	1.172	1.96	Not supported
H5	IT $\rightarrow$ University Performance	0.1315	1.424	1.96	Not supported

The strongest structural relationship was the effect of knowledge management on competitive advantage. This result indicates that institutional practices for acquiring, sharing, storing, and applying knowledge are closely associated with the development of distinctive institutional capabilities. The effect of competitive advantage on university performance was also strong, confirming that differentiated capabilities provide an important pathway to improved institutional outcomes.

The direct KM-to-performance relationship remained significant even when competitive advantage was included in the model. This finding suggests that KM contributes to university performance not only through competitive positioning but also through direct improvements in learning, coordination, decision-making, research, and administrative effectiveness. By contrast, the two IT paths were positive but below the critical t-value, indicating that the observed coefficients were not sufficiently large to reject the null hypotheses in this sample.

The R^2 values show that KM and IT explained 41.68% of competitive advantage, while KM, IT, and competitive advantage jointly explained 53.84% of university performance. These values indicate moderate explanatory power. They also imply that other factors—such as leadership, institutional strategy, organisational culture, financial resources, programme quality, external regulation, and staff capability—remain important for understanding institutional competitiveness and performance.

C. Discussion and Implications

The significant effects of KM confirm that institutional knowledge is a strategic resource for Thai private universities. Universities that systematically create, capture, share, store, and apply knowledge are better able to improve research, decision-making, organisational learning, service quality, and stakeholder responsiveness. These results are consistent with prior studies linking KM to organisational performance and competitive advantage (Mills & Smith, 2011; Jamil & Lodhi, 2015; Jasinskas et al., 2015; Zaid et al., 2012).

Competitive advantage also had a strong positive effect on university performance. Distinctive capabilities in educational

quality, research excellence, innovation, industry collaboration, graduate employability, and institutional reputation can attract students, faculty, research funding, and strategic partnerships. This result supports the proposition that effective use of valuable organisational resources enhances performance (Li et al., 2006).

The nonsignificant direct effects of IT suggest that digital infrastructure has become a widely available enabling resource rather than a sufficient source of differentiation. Technology can support teaching, administration, communication, and knowledge integration, but its value depends on complementary human capabilities, leadership, organisational culture, and strategic use. This interpretation is consistent with research showing that IT may improve operational efficiency without automatically producing sustainable competitive advantage (Cakmak & Taş, 2012).

University leaders should therefore combine digital investment with knowledge-sharing culture, staff development, incentives for collaboration, institutional repositories, research networks, and mechanisms for applying knowledge to decisions. Technology policy should be evaluated by how effectively it strengthens knowledge processes and institutional capabilities, rather than by the acquisition of systems alone.

1) Knowledge Management and University Performance

The support for H1 shows that KM has a significant positive effect on university performance. Institutions that manage knowledge systematically can reduce duplication, preserve organisational memory, improve the quality of decisions, and disseminate successful academic and administrative practices. The result is consistent with Mills and Smith (2011) and Zaied et al. (2012), who found that knowledge-management capabilities improve organisational performance. It also supports evidence from higher education indicating that KM practices can strengthen institutional outcomes (Jamil & Lodhi, 2015).

For Thai private universities, this relationship is strategically important because competition and resource constraints increase the value of learning from internal experience. Policies that encourage documentation, interdisciplinary collaboration, mentoring, research networks, and reuse of institutional knowledge can improve both academic and administrative performance. KM should therefore be embedded in governance, quality assurance, research management, and professional-development systems.

2) Knowledge Management and Competitive Advantage

The support for H2 confirms that KM helps universities develop capabilities that competitors cannot easily imitate. Knowledge embedded in experienced employees, routines, partnerships, curricula, research groups, and institutional culture accumulates over time and is difficult to purchase as a complete package. Effective KM allows the institution to combine these resources into distinctive educational programmes, faster innovation, stronger stakeholder relationships, and more responsive services.

This result aligns with Carter and Scarbrough (2001) and Jasinskas et al. (2015), who emphasised the role of knowledge in creating competitive capability. The implication is that university strategy should not focus solely on external promotion or physical facilities. Long-term advantage also depends on the internal capacity to create, retain, and mobilise knowledge across organisational boundaries.

3) Competitive Advantage and University Performance

H3 was supported, indicating that stronger competitive advantage is associated with higher university performance. Institutions with recognised educational quality, research capability, innovation, industry relationships, international networks, and graduate outcomes can attract higher-quality students and staff, secure funding, and develop strategic partnerships. These benefits reinforce research productivity, employee commitment, and external engagement.

The finding is consistent with Li et al. (2006), who linked competitive advantage to superior organisational performance. In the university context, the result suggests that performance-improvement initiatives should be connected to a clear differentiation strategy. Institutions need to identify the capabilities through which they can create distinctive value rather than attempting to imitate every feature offered by competitors.

4) Information Technology and Competitive Advantage

H4 was not supported. One explanation is that digital systems have become necessary but common infrastructure across universities. Learning-management systems, databases, online communication, and cloud platforms may improve efficiency, yet similar technologies can be acquired by competing institutions. Therefore, possession of technology alone does not satisfy the rarity and inimitability conditions associated with sustainable advantage.

The result does not imply that IT is unimportant. Rather, it indicates that competitive value depends on complementary organisational practices. Technology becomes more strategic when it is integrated with high-quality data, staff competence, process redesign, knowledge sharing, and innovative service models. This interpretation is consistent with Cakmak and Taş (2012), who distinguished operational benefits from sustainable competitive differentiation.

5) Information Technology and University Performance

H5 was also not supported. Although IT facilitates teaching, learning, administration, and communication, the direct path to overall university performance was not statistically significant. The performance of digital systems may be mediated by factors such as user capability, organisational learning, leadership, service design, and knowledge integration. A university can invest heavily in systems without achieving strong outcomes if employees do not use the systems effectively or if the data generated are not translated into decisions.

University leaders should therefore evaluate technology investments through their contribution to institutional processes and outcomes. Measures of success should include adoption, data quality, process improvement, knowledge reuse, student and staff experience, research support, and decision quality—not merely the number of platforms or hardware assets acquired. Digital transformation should be treated as a socio-technical change programme that combines people, processes, knowledge, and technology.

IV. CONCLUSIONS

This study demonstrates that knowledge management is a stronger direct determinant of competitive advantage and university performance than information technology in the participating Thai private higher education institutions. KM significantly improved both competitive advantage and performance, and competitive advantage significantly enhanced performance. IT did not produce significant direct effects on either endogenous construct.

The findings imply that digital transformation should be managed as an organisational capability rather than a technology-acquisition programme. Universities should continue investing in digital infrastructure while strengthening knowledge creation, storage, sharing, application, collaboration, and continuous learning among academic and administrative staff.

The study is limited to selected private institutions and four constructs, which restricts generalisability. Future studies should examine public-private differences, adopt longitudinal designs, and include digital-transformation capability, leadership, organisational innovation, artificial-intelligence adoption, and organisational agility.

REFERENCES

- Agbim, K. C., Oriarewo, G. O., & Owutuamor, Z. B. (2013). The impact of knowledge management capability on organizational performance: A survey of the services sector. *Journal of Business Management & Social Sciences Research*, 2(9).
- Bratianu, C., & Bolisani, E. (2015). Knowledge strategy: An integrated approach for managing uncertainty. In A. Garlatti & M. Massaro (Eds.), *Proceedings of the 16th European Conference on Knowledge Management* (pp. 169-177). Academic Conferences and Publishing International.
- Cakmak, P. I., & Taş, E. (2012). The use of information technology on gaining competitive advantage in Turkish contractor firms. *World Applied Sciences Journal*, 18(2), 274-285.
- Caloghirou, Y., Tsakanikas, A., & Vonortas, N. S. (2001). University-industry cooperation in the context of the European framework programmes. *The Journal of Technology Transfer*, 26(1-2), 153-161.
- Carter, C., & Scarbrough, H. (2001). Towards a second generation of knowledge management? The people management challenge. *Education + Training*, 43(4/5), 215-224.
- Chen, Y. J. (2007). Relationships among service orientation, job satisfaction, and organizational commitment in the international tourist hotel industry. *Journal of American Academy of Business*, 11(2), 71-82.
- Flagg, D., Gilley, O. W., & Park, J. C. (2011). Job market signaling: What drives the productivity of finance Ph.D.s? *Financial Management*, 40(2), 483-513.
- Gholipour, R., Jandaghi, G., & Hosseinzadeh, S. A. A. (2010). Explanation of knowledge management enabler as a latent variable: A case study of SMEs in Iran. *African Journal of Business Management*, 4(9).
- Inkpen, A. C., & Dinur, A. (1998). Knowledge management processes and international joint ventures. *Organization Science*, 9(4), 454-468.
- Jamil, R. A., & Lodhi, M. S. (2015). Role of knowledge management practices for escalating universities performance in Pakistan. *Management Science Letters*, 5, 945-960.
- Jasinskas, E., Svagzdiene, B., & Simanavicius, A. (2015). The influence of knowledge management on the competitive ability of Lithuanian enterprises. *Procedia - Social and Behavioral Sciences*, 191, 2469-2475.
- Kansal, D., & Sengar, D. (2011). Knowledge management with information technology. *International Journal of Information Technology and Knowledge Management*, 4(1), 201-204.
- Khan, R. A. (2012). Knowledge management: A framework for competitive advantage. *Global Journal for Information Technology and Computer Science*, 1(1).
- Lee, S. M., & Hong, S. (2002). An enterprise-wide knowledge management system infrastructure. *Industrial Management & Data Systems*, 102(1), 17-25.
- Li, S., Ragu-Nathan, B., Ragu-Nathan, T. S., & Rao, S. (2006). The impact of supply chain management practices on competitive advantage and organizational performance. *Omega*, 34(2), 107-124.
- Mills, A. M., & Smith, T. A. (2011). Knowledge management and organizational performance: A decomposed view. *Journal of Knowledge Management*, 15(1), 156-171.
- Minbaeva, D., Pedersen, T., Björkman, I., Fey, C. F., & Park, H. J. (2003). MNC knowledge transfer, subsidiary absorptive capacity, and HRM. *Journal of International Business Studies*, 34(6), 586-599.
- Nelson, R. R., & Winter, S. G. (2002). Evolutionary theorizing in economics. *Journal of Economic Perspectives*, 16(2), 23-46.
- Oliver, S., & Kandadi, K. R. (2006). How to develop knowledge culture in organizations? A multiple case study of large distributed organizations. *Journal of Knowledge Management*, 10(4), 6-24.
- Quinn, J. B. (1992). *Intelligent enterprise: A knowledge and service based paradigm for industry*. Simon & Schuster.
- Tanriverdi, H. (2006). Performance effects of information technology synergies in multibusiness firms. *MIS Quarterly*.
- Wang, Z., & Wang, N. (2012). Knowledge sharing, innovation and firm performance. *Expert Systems with Applications*, 39(10), 8899-8908.
- Zaied, A. N. H. (2012). An integrated knowledge management capabilities framework for assessing organizational performance. *International Journal of Information Technology and Computer Science*, 2, 1-10.
- Zaied, A. N. H., Hussein, G. S., & Hassan, M. M. (2012). The role of knowledge management in enhancing organizational performance. *International Journal of Information Engineering and Electronic Business*, 4(5), 27.