

Aligning Enterprise Knowledge Management Systems to Improve the Efficiency and Effective Performance of Mobile Telecommunications Companies: A Case Study of Korek and Mass Telecom in Northern Iraq.

By

Dr. Goran Yousif Ismael

Ph.D. In Innovation and Knowledge Management. Lecturer At Noble Institute
Department of Business Management
Email: Goran.yusif@yahoo.com

Raweez Saber Ismael

M.Sc. In Innovation and Knowledge Management Head of Business Management
Department at Noble Institute - Pirmam Road Erbil, Iraq
Email: Raweez.ismael@gmail.com

Statement Of the Problem

It is of no doubt to note mobile telecommunications companies are one of the key players that facilitate both social and economic development. The importance of mobile telecommunications companies is not only attached to the communication aspect but also to a key number of aspects. Liao et al. (2009) hinted that mobile telecommunications companies (MTCs) play a vital role towards fostering innovative developments. Notable examples include the likes of mobile internet banking, mobile money transfer, mobile learning.

Meanwhile, MTCs are considered to be in possession of a huge potency to greatly transform and impact quite a number of aspects ranging from religious, legal, social and economic aspects to political aspects (Gerpott & Jakopin, 2005). However, such an ability is believed to be strongly determined by their performance levels (Taticchi, Tonelli & Cagnazzo, 2010). Of which observations are pointing out that MTCs still have a long way to go in as far as performance is concerned. The big question was 'what can be done to boost the performance of MTCs', (Baird & Su, 2018). Though the provided answers strongly pointed out towards the need to use enterprise knowledge management systems (EKMS) as a platform upon which sound performance can be attained, more is still desired. This is because conditions under which EKMS can be used as a performance enhancing tool have not been duly examined. For instance, a study by Kwak and Park (2016) established that it is practically impossible to attain high performance levels without proper legal structures. Almatrooshi, Singh and Farouk (2016) concurred with this notion and highlighted that these conditions are not only restricted to legal frameworks but also incorporates quite a number of fluid and transitory aspects such as time and place which are always bound to change any time and remained to be explored. Moreover, EKMS itself is a broad and contemporary concept whose application in industries such as the mobile telecommunications industry is bound to be determined by numerous things and pose diverse effects. In addition, the use of EKMS is widely applied to operational environments that are characterised by intensive production activities. Hence, their applicability in MTCs can have significantly different effects. Worse when Doziellozor, Love and Treloar (2002) considered that EKMS always needs constant realignment. More so, the use of EKMS to deal with performance issues needs more clarification for related similar studies did not expound on the exact organisational performance aspects (Chennell et al., 2000; Guest, 2002). This is notably true with regards to efficiency and effectiveness as noted by Baird and Su (2018). This

entails that the hypothesis depicts that 'if MTCs adopt EKMS, then their effective and efficient performance will increase. However, Almatrooshi, Singh and Farouk (2016) did not effectively operationalize the terms effective and efficient performance in terms of productivity. Hence, this hypothesis will be examined on an individual level with regards as to how best EKMS can be realigned to improve the effective and efficient performance of MTCs. This study therefore seeks to examine how EKMS can be realigned to improve the effective and efficient performance of MTCs.

Objective Of the Study

The main emphasis of the study is to examine ways EKMS can best be realigned to enhance the effective and efficiency performance of MTCs. Such is centered on the need to narrow the broader aspects of effective and efficiency performance into one concise and precise aspect of productivity.

The study also seeks to examine conditions under which EKMS can be properly aligned to suite the operational environment faced by MTC so as to warrant a significant positive change in productivity. This is because factors such as legal aspects, economic stability, availability of capital funds, investor sentiments and investment climate etc., have a significant influence on the adoption and use of EKMs. All these factors need to be examined and the novelty of this study lies in its potency to highlight the conditional situation under which EKMS can be effectively used to institute positive and significant changes in productivity of MTCs. This will be done with respect to efficiency and effectiveness as the main attributes. The study thus seeks to test the validity of the hypothesis that the introduction of EKMS results in an improvement in productivity. Hence, the aim of the study is said to be the need to examine the relationship that exist between EKMS and productivity. This will be accomplished by pioneering the application and realignment of the technology acceptance model (TAM) to examine how the acceptance of EKMS by MTCs affects their productivity levels of MTCs.

Significance Of the Study

There are generally different ideas concerning how to measure corporate performance. More often do studies restrict performance to what has been weighed against revenue inflows and costs (Guest, 2002). But corporate performance is a broader concept which includes things such as corporate social responsibility, focus on customer, clients etc., as denoted by the use of balanced scorecard (Dozie, Love & Treloar, 2002). Having different measures of corporate performance thus stands as challenge on the lack of a common base upon which results on the determinants of corporate performance can be compared and contrasted together.

In a study conducted by Almatrooshi, Singh and Farouk (2016), corporate performance was presumed to be measured in terms of effectiveness and efficiency. However, corporate performance includes numerous and different indicators which can be established using a balance score card. As such, corporate performance can be measured in terms of social performance, environmental performance, employee performance, etc. All these measures of corporate performance were not acknowledged and this study will thus seek to include these aspects in operationalizing the definition of performance. Furthermore, EKMS was defined as the use of information systems to manage an organisation's knowledge resources. This definition does not pay attention to the ways through which EKMS initiates positive improvements in performance. It can be noted that improvements in performance is observable through improved time management, better management, organisation, increased access to knowledge, better decisions made etc. All these can be reflected through a decrease in labour

turnover, wages and salaries, and other operational and non-operational costs, increase in net profit margins, number of customers serviced, number of services offered etc. incorporating all these aspects can significantly enrich the study by adding towards its novelty and originality.

Centobelli, Cerchione and Esposito (2018) conducted a relatively similar study in terms of effective and efficient performance. Their first hypothesis was based on the presumption that the use of EKMS causes an improvement in effective performance. On the other hand, the second hypothesis considered that if companies use EKMS, then their efficient performance will increase. However, this study will seek to test the validity of the statement that the use of EKMS to provide knowledge will result in an improvement in productivity. But efficiency and effectiveness will be considered to be the attributes of productivity.

In terms of theoretical frameworks, it is to the knowledge of the author that existing studies on the related topic have not yet managed to incorporate and examine the underlying theories surrounding the use of EKMS. It is worthy to note that the use of EKMS is determined by the way employees of MTCs accept the use and effects posed by EKMS and if they do not accept it, then the use of EKMS will not be effective and efficient. This is explainable through the technology acceptance model which related studies have not yet managed to incorporate. In addition, the use of EKMS is also determined by its prevalence and diffusion. Hence, it is also proper to look at how the diffusion of innovative strategies such EKMS influence its effectiveness and efficiency towards enhancing corporate performance. The other studies examined this issue based on macro level but this study seeks to examine this issue on a microlevel.

Other studies such as Kwahk and Park (2016) and Kwahk and Park (2016) employed the structural theory towards looking at this issue. But this studies strongly argues that the rationality theory applies significantly and that it should be used to deal with this issue. This is because profit maximisation and cost minimisation result in huge significant benefits which range from an improvement in competitiveness, increase in market share, growth and expansion, diversification etc. hence, it becomes rational for firms to attain higher levels of performance so as to reap these benefits.

In terms of the research design most studies focus on the use of a quantitative approach (Alavi & Leider, 1999; Altamony et al., 2016) and qualitative method (Heisig et al., 2016). This study will incorporate both methods and use a mixed design approach. The mixed design approach will encompass cross-sectional analysis which will be done using primary data collected using questionnaires and interviews, and a comparative analysis which will be done using secondary data collected from company's financial statements and end of year reviews. Moreover, a triangulation will also be used and will include theory, investigator and data triangulation methods.

These studies have inherent strengths in the sense that they employed different techniques such as the Fuzzy logic approach (Centobelli, Cerchione & Esposito, 2018). The other strength relates to their geographical area (Heisig et al., 2016) which is quite different from this one (focuses on the Middle East especially with regards to North Iraq). However, these studies do lack in terms of validity. That is, not much was done to validate the research instruments. As a result, this study will employ convergent and construct validity as part of validity tests. This will be supported by the use of Cronbach's alpha test to measure the internal consistency of the variables.

This study addresses the debate that performance is not restricted to efficiency and effectiveness but includes another of aspects which range from social, environmental,

employee performance to customer performance. The also seeks to address the notion that the effects of EKMS are one way, and not two-way. That is, it argues that there are mediating variables which influence the use of EKMS to target an improvement in corporate performance.

Also, this study proposes to extend ideas given by Alavi and Leidner (1999) study by looking at how EKMs issues, challenges, and benefits can affect the efficient and effective performance of mobile telephone companies.

Justification Of the Study

Political Implications: Quite a number of people are falling victims to sudden and untimed political catastrophes due to lack of access to timeous or instant information communication mediums such as mobile internet. Hence, an improvement in the performance of MTCs will results in widespread access to mobile communication platforms which the government can tap into to educate and make people aware of political incidences.

Academic Implications: The use of EKMS and its underlying concepts are always bound to change and hence academicians must be in a position to capture such changes and deal with them accordingly through research. Moreover, the application of EKMS with regards to corporate performance varies with institutions and how they define and measure performance. All these aspects need to be looked into if a proper and sound explanations about the effects of EKMS on performance are to be realised.

Theoretical implications: it was be noted that the adoption and effective use of EKMS is strongly determined by the level of acceptance to which employees agree to use EKMS and accept its associated consequences. That is, the level of acceptance of EKMS determines how well MTC employees will agree to and actually put EKMS to effective use. But this has not yet been accomplished and hence there is a greater need to employ theoretical aspects depicted by the technology acceptance model to examine how best EKMS can be realigned to enhance the performance of MTCs. Moreover, the rate at which EKMS is being used in MTCs is also influenced by the rate at which such technological developments have proliferated and spread to economies such as Northern Iraq. Thus, the diffusion innovation model needs to be incorporated into the study. Such is important to test the underlying theories in a number of wide and diverse areas so as to determine the extent to which they can be applied, offer reliable and sound explanations, and used to deal with corporate challenges such as those faced by MTCs in Northern Iraq.

Economic Implications: The economic benefits that can be realised from this study cannot be underestimated. For instance, it is believed that mobile money transfer services increase the government's revenue earning capacity through a taxable revenue of around US\$500 million especially in the USA. More so, operational activities behind the use of mobile telephones have resulted in the establishment of other business activities such as internet banking, e-shopping, e-learning which can further rake in millions of dollars annually. Such is important to Northern Iraq which has been going through a series of a ravaging financial crisis.

Social and Cultural Implications: There is an immense improvement in social lives that follows the use of mobile telecommunications devices. Such are not limited to an increase in knowledge through e-learning but also extend cultural exchange of information. The use of mobile telephone devices and other related products also translates to social development or better social well-being. These are some of the key aspects that are lacking among people in Northern Iraq.

Normative Implications:

The effectiveness and efficiency of EKMS should be measured based on its ability to lower operational costs, quantity of used materials, causes an increase in the number of service provided by MTCs.

Scope Of the Study

Efforts to maximise corporate performance whether by boosting sales and revenue levels and lowering cost margins are no other an expression of rationality. This study therefore adopts a rational approach to the examination of how EKMS can be used to improve the effective and efficient performance of MTCs. It is undeniable that making huge profit margins and enhancing other performance indicators gives MTCs a competitive advantage other firms in the same industry. Such offers an opportunity to use the additional profits to expand regionally or internationally beyond Northern Iraq borders into other countries. Hence, it is sensible to argue that enhancing effective and efficient performance of MTCs is a rational way of MTCs to conduct their business activities.

Table 1: *Instrumentalization of variables*

Effective and efficient performance	Enterprise knowledge management system
Wages and salaries	number of well-trained employees
Level of Net Profit Margin	Time spent working
The number of customer complaints raised	Number of departmental complaints
Mobile internet coverage	Percentage of labour turnover
Number of mobile services	Output or production units produced per worker
Number of mobile subscribers	Number of recruited employees

The data will be collected through the use of questionnaires and interviews (obtrusive) and annual financial statements (unobtrusive). This will also be done by interviewing 7 key informants who are responsible for the direct implementation of EKMS in MTCs. Data from secondary sources will be collected using documentary analysis and this will include internet materials, journals and articles, textbooks and annual financial statements (balance sheets, profit and loss, sales and cashbooks etc.).

Population and sample selection

The study is drawn towards the examination of MTCs in Northern Iraq and presently there are two MTCs in Northern Iraq namely Korek Telecommunications Company and Mass Company. The number of employees in these two companies is estimated to be 104 and 88 employees in the Erbil branch alone. Hence, the study population is 202 employees working for Korek Telecommunications Company and Mass Company in Erbil, Northern Iraq. The study will thus employ a sample size determination formula provided by Mugenda (2006) which considers to be more effective for estimating sample sizes given that the populations level does not exceed 250 participants. The formula is outlined as follows;

$$S = \frac{P}{1 + P(MOE^2)} \quad (1)$$

Where the sample size is denoted by *S*, population size by *P* and the margin of error by *MOE* which is given as 0.05. Substituting the MOE and the population size in expression (1) gives the following;

$$S = \frac{202}{1+202(0.05^2)} (2)$$

Which results in a figure of 135 and hence a sample size of 135 respondents will be used in this study and this implies that 135 questionnaires to employees working for Korek Telecommunications Company and Mass Company.

Research Methodology

Research design

Foremost, the study will adopt a mixed research approach that include a combination of a cross-sectional study (qualitative research method) and a comparative analysis (quantitative research method). This approach will be supported by the adoption of a combination of theoretical triangulation and data triangulation so as to bridge gaps in research.

Triangulation means using more than one method to collect data on the same topic. This is a way of assuring the validity of research through the use of a variety of methods to collect data on the same topic, which involves different types of samples as well as methods of data collection. However, the purpose of triangulation is not necessarily to cross-validate data but rather to capture different dimensions of the same phenomenon.

There are different methods in triangulation like Investigator triangulation, theory triangulation, methodological triangulation, environmental triangulation all have different purpose to check the validity and see the difference of opinion about the phenomena. This study will be restricted to the use of data triangulation, investigator triangulation and theory triangulation,

Table 2: *Hypotheses, data and sources*

Hypothesis	Data needed	Data collection type	Sources
If companies use enterprise knowledge management systems to provide easy access to knowledge, then MTCs will be able to service more mobile subscribers	Annual number of mobile subscribers;	Secondary	customer service database;
	Annual number of mobile services subscribed to	Secondary/primary	Annul financial statements, company reviews company publications questionnaire
If companies use enterprise knowledge management systems to provide easy access to knowledge, then MTCs will be able to provide better mobile internet coverage	Monthly or annual data on the number of days without disruptions in internet coverage	Secondary	customer service database;
	Number of internet boosters in a given area	Secondary	Annul financial statements, End of year company reviews
The use of enterprise knowledge management systems to provide easy access to knowledge has no significant positive effects on the reduction in wages and salaries incurred by mobile telecommunications companies from the year 2014 to 2018	Wages and salaries paid per hour	Secondary/primary	Time sheets
	Number of hours worked per day	Secondary/primary	Labour cost sheets
			Questionnaires Interviews

The use of enterprise knowledge management systems to provide easy access to knowledge has no significant positive effects on the number of customer complaints raised against mobile telecommunications companies from the year 2014 to 2018	number of customer complaints	Secondary/primary	company reviews financial statements End of year reviews Questionnaires Interviews
If MTCs use enterprise knowledge management systems to provide easy access to knowledge, then MTCs will have a high number of well-trained employees	Number of training programs offered by MTCs. Number of employees enrolled in courses and other tertiary programs	Secondary/primary	company reviews financial statements End of year reviews Questionnaires Interviews

Methodology of data collections

The study will rely on the combined use of both obtrusive (specifically questionnaire and interviews) and unobtrusive methods (Financial statements, company reviews like mid and year end reviews) to collect the required data. This is because a combined use of these methods allows the study to obtain information about opinions which are not quantifiable using quantitative analysis. Moreover, the use of unobtrusive methods makes it easy to make profound generalisations on trends and performance levels. The tool will help to identify the data needed and will be checked for the validity of alternative explanations as follows;

- Questionnaires: Interviews: will provide details on the possible challenges key informants encounter as well as solutions needed to improve the effectiveness of EKMS with regards to effective and efficient performance of MTCs. Facial validity, construct and convergent validity tests will be used to check the validity of the proposed tools.
- Financial statements: Provides details on the changes in the company's net profit margins and number of mobile subscribers per year, wages per hour, sim cards produced per hour.

Ethical approach

As part of efforts to uphold good ethical standards, the researcher will apply for ethical approval from the university of study as well as from the 3 MTCs to acquire permission to conduct the study. Consent and participation aspects of good ethical standards will also be catered to prior to the execution of the study.

Methods of data analysis

The data will be analysed using structural equation modelling (SEM) because SEM offers a more detailed and effective way of analyse the alignment of EKMS to improve the effective and efficient performance of MTCs. This will be accomplished using SPSS *version 23* and AMOS *version 23* as well. In addition, same makes it easy to determine the covariances between the variables. Moreover, the mediating effects between EKMS and performance can easily be determined. It is through SEM that the answers to the proposed hypotheses will be established. Also, convergent and construct validity tests will be conducted to determine the validity of the used tools. This will be reinforced by the use of Cronbach's alpha to determine the internal consistency of the variables. Model fitness tests will also be conducted with the respect to (i) Goodness of fit index, (ii) Comparative fit index and (iii) Normed fit index. On

the other hand, data presentation will assume the form of tables, charts and graphs so as to help present the findings in a more meaningful form.

Structure Of the Study

The study will be structured into five chapters in which the first chapter provides insights about the underlying performance challenges being faced by MTCs in Northern Iraq. This chapter also illustrates how EKMS can be used to deal with performance challenges in a way that will result in effective contribution by MTCs towards, social, political, economic and religious development. This chapter also sheds light as to why it is important to undertake this study in terms of political, academic, theoretical, economic, social and cultural and normative implications. The second chapter of the study focuses on deploying the related theoretical frameworks especially with regards to the technology acceptance model and the diffusion innovation model.

This chapter also looks in details on the use of EKMS, conditions under which it can be used effectively, benefits, challenges and possible measures that can be used to enhance its effectiveness. This will also include defining the term performance, how its various ways of measurement and aspects affect possible deductions that can be made from this study. This also includes reviewing related studies so determine if they agree or contrast with the results that are going to be obtained as well as identifying possible gaps.

The third chapter focuses on the use of a cross-sectional study and the use of obtrusive data collection methods notably a questionnaire. The use of random sampling to sample participants from three of Northern Iraq MTCs. This will also include giving out participation form and consent letters, drawing out of confidentiality and anonymity aspects as well as the use of factor analysis. The use of data analysis methods such as descriptive statistics, correlation coefficient test, Cronbach's alpha test as a measure of reliability will also be looked into.

The fourth chapter will provide a presentation of the obtained findings in relation to how EKMS improves performance, conditions under which EKMS can be used effectively and possible measures to that can be used to enhance its effectiveness. It is in this chapter that the obtained findings are discussed in relation to the given related studies.

The last chapter provides details about conclusions drawn from the study as to how EKMS can be realigned to improve performance, and the nature of relationship between EKMS and these factors. This will also cover details about which factors significantly influence the effectiveness of EKMS. Conclusions and recommendations will be made based on the deduced ideas.

References

- Alavi, M., & Leider, D. (1999, January). Knowledge management systems: Emerging views and practices from the field. In Proceedings of the 32nd Annual Hawaii International Conference on Systems Sciences. 1999. HICSS-32. Abstracts and CD-ROM of Full Papers (pp. 8-pp). IEEE.
- Alavi, M., & Leidner, D. E. (2001). Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS quarterly*, 107-136.

- Almatrooshi, B., Singh, S. K., & Farouk, S. (2016). Determinants of organizational performance: a proposed framework. *International Journal of Productivity and Performance Management*, 65(6), 844-859.
- Altamony, H., Al-Salti, Z., Gharaibeh, A., & Elyas, T. (2016). The relationship between change management strategy and successful enterprise resource planning (ERP) implementations: A theoretical perspective. *International Journal of Business Management and Economic Research*, 7(4), 690-703.
- Baird, K., & Su, S. (2018). The association between controls, performance measures and performance. *International Journal of Productivity and Performance Management*, 67(6), 967-984.
- Centobelli, P., Cerchione, R., & Esposito, E. (2018). Aligning enterprise knowledge and knowledge management systems to improve efficiency and effectiveness performance: A three-dimensional Fuzzy-based decision support system. *Expert Systems with Applications*, 91, 107-126.
- Centobelli, P., Cerchione, R., & Esposito, E. (2018). How to deal with knowledge management misalignment: A taxonomy based on a 3D fuzzy methodology. *Journal of Knowledge Management*, 22(3), 538-566.
- Chennell, A., Dransfield, S., Field, J., Fisher, N., Saunders, I., & Shaw, D. (2000, July). OPM: a system for organisational performance measurement. In *Proceedings of the performance measurement—past, present and future conference*, Cambridge (pp. 19-21).
- Coccia, M. (2016). Radical innovations as drivers of breakthroughs: characteristics and properties of the management of technology leading to superior organisational performance in the discovery process of R&D labs. *Technology Analysis & Strategic Management*, 28(4), 381-395.
- Doziellozor, B., Love, P. E., & Treloar, G. (2002). The impact of work settings on organisational performance measures in built facilities. *Facilities*, 20(1/2), 61-67.
- Gerpott, T. J., & Jakopin, N. M. (2005). The degree of internationalization and the financial performance of European mobile network operators. *Telecommunications Policy*, 29(8), 635-661.
- Guest, D. (2002). Human resource management, corporate performance and employee wellbeing: Building the worker into HRM. *The journal of industrial relations*, 44(3), 335-358.
- Heisig, P., Suraj, O. A., Kianto, A., Kemboi, C., Perez Arrau, G., & Fathi Easa, N. (2016). Knowledge management and business performance: global experts' views on future research needs. *Journal of Knowledge Management*, 20(6), 1169-1198.
- Kwahk, K. Y., & Park, D. H. (2016). The effects of network sharing on knowledge-sharing activities and job performance in enterprise social media environments. *Computers in Human Behavior*, 55, 826-839.
- Liao, C. H., Chen, C. W., Wu, H. C., & Cheng, M. H. (2009, January). Grey relational analysis of operational performance for mobile telecommunications companies in Taiwan. In *2009 WRI International Conference on Communications and Mobile Computing* (Vol. 3, pp. 348-352). IEEE.
- Maletič, M., Maletič, D., Dahlgaard, J. J., Dahlgaard-Park, S. M., & Gomišček, B. (2016). Effect of sustainability-oriented innovation practices on the overall organisational performance: An empirical examination. *Total Quality Management & Business Excellence*, 27(9-10), 1171-1190.
- Migdadi, M. M., Zaid, M. K. S. A., Yousif, M., & Almestarihi, R. D. (2018). An empirical examination of collaborative knowledge management practices and organisational performance: the mediating roles of supply chain integration and knowledge quality. *International Journal of Business Excellence*, 14(2), 180-211.

- Saunila, M. (2016). Performance measurement approach for innovation capability in SMEs. *International Journal of Productivity and Performance Management*, 65(2), 162-176.
- Singh, J. (2013). Practicing knowledge management system. *International Journal of Information, Business and Management*, 5(4), 209.
- Taticchi, P., Tonelli, F., & Cagnazzo, L. (2010). Performance measurement and management: a literature review and a research agenda. *Measuring business excellence*, 14(1), 4-18.
- Wang, M. H., & Yang, T. Y. (2016). Investigating the success of knowledge management: An empirical study of small-and medium-sized enterprises. *Asia Pacific Management Review*, 21(2), 79-91.