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    INTRODUCTION

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    NEED/IMPORTANCE OF THE STUDY

    STATEMENT OF THE PROBLEM

    OBJECTIVES

    HYPOTHESES

    RESEARCH METHODOLOGY

    RESULTS & DISCUSSION

    FINDINGS

    RECOMMENDATIONS/SUGGESTIONS

    CONCLUSIONS

    SCOPE FOR FURTHER RESEARCH

    ACKNOWLEDGMENTS

    REFERENCES

    APPENDIX/ANNEXURE

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CONTRIBUTIONS TO BOOKS
*   Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES
*   Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS
*   Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

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*   Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, KurukshetraUniversity, Kurukshetra.

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PROBLEMS IN IMPLEMENTING E-COMMERCE IN OMAN

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OMZEST, MUSCAT, OMAN

ABSTRACT

This research paper has examined the significance of various problems in implementation of e-commerce solution in business organisations in Oman. Oman and Gulf Cooperation Council (GCC) member states have witnessed substantial progress in the field of infrastructure development in the last decade. Information technology sector has also seen substantial investment and progress. However, despite these positive developments and abundant resources, GCC countries in general and Oman in particular, have not been able to catch up with the pace of digital development in the rest of the world. The research paper attempts to identify the problems in implementing e-commerce in Oman. This research paper on the basis of analysis of data through hierarchical multiple regression modeling and multiple response analysis of the data has identified statistically significant problems in implementation of e-commerce in GCC nations and outlined key policy options that GCC nations can consider in formulation of policies to stimulate, support and maximize the effect e-commerce has on their economies.

KEYWORDS

e-commerce, GCC, hierarchical multiple regression, Oman, problems.

INTRODUCTION

The dawn of new millennium has opened the floodgates of technological innovations. Technology and technological innovations have always played a key role in reshaping and revolutionizing the business practices. Rapid advancements in the field of information and telecommunications technologies in the latter part of the 20th century have been truly remarkable and have resulted in amazing transformation of some societies (notably Western) into information-based cultures.

Rapid emergence and acceptance of e-commerce has resulted in effecting deep impact on business world. Worldwide it has become a major trend especially among Trans National Companies (TNCs). These companies are conducting business in many countries and working through various partners such as suppliers, dealers, importers and carry & forward (C&F) agents , distributors and retailers , the coordination between these entities has become vital so as to be successful in the competitive environment. An integrated supply chain with a well designed e-commerce infrastructure may improve their performance and minimize costs. The use and application of electronic commerce in business practices is quite varied between different parts of the world. There has been rapid growth in the use of e-commerce in North American, West European, South East Asian countries, while in Middle East Asia it has yet to see that level of growth. Oman, which is the founding member of the Gulf Cooperation Council [GCC] provides an ideal context for analysis of the problems in E-Commerce development and implementation. Electronic commerce is in its nascent stages of development in GCC countries in general and in Oman in particular. Information and Communication technology development, adoption and access are far from adequate in the GCC region. The problems faced by the region are related to the low uptake and less than efficient use of new technologies, specifically in the field of information and technology. It is further compounded by digital illiteracy, a vastly absent enabling environment, and the often limited awareness at decision-making levels of the importance of sound and forward-looking ICT policies and strategies as well as the potential for ICT applications.

LITERATURE REVIEW

Review of the available literature shows that the bulk of the conceptual works and empirical studies on E-Commerce are in the context of North & Latin America, Europe and Japan. There is a **paucity of writings** focusing on the impact of electronic commerce implementation in organization in other parts of the world especially Oman and GCC. One of these overlooked areas is the GCC countries where writings still focus on end-user computing rather than on "E" and its role and impact of its implementation in business.

The existing literature is largely fragmented and therefore does not offer a holistic view of the factors affecting e-commerce implementation results . Almost negligible work has been done to examine the statistical significance of problems faced by organization in implementation of ecommerce in GCC region. There have been very few meta-analyses of the literature which attempt to bring this aspect of research to provide a holistic picture of e-commerce implementation results. Up till 2004, almost negligible research was undertaken for assessment of e-commerce implementation results and analysis of factors that influence these results.

Research study undertaken by **Radovilsky and Hegde (2004) [1]** to investigate the factors that affect e-commerce implementation is one of the pioneering work in this regard . They carried out a survey to identify and determine the factors influencing e-commerce implementation in San Francisco Bay region, West Coast of USA , which is considered as the financial centre of West Coast of USA. Their research paper presented a general assessment of e-commerce implementation results and analysis of factors that influence these results, however, the problems in implementation of eCommerce were not clearly identified and no empirical evidence was given to establish the statistical significance of these problems.

Teo et al (2004)[2] have done a meta analysis of literature related to factors affecting adoption of e-commerce specifically in small and medium enterprises. They concluded from the meta analysis that the factors affecting the adoption of e-Commerce are highly complex, with various studies providing different lists of factors, or with studies focused on understanding or identifying a particular factor, or groups of factors, but ignoring the bigger picture. They have identified some meta factors from the available literatures, which are related to adoption of e-commerce. However, different literatures have conflicting viewpoints about these meta factors. In addition to this , none of these meta factors are related to measure the impact of e-commerce implementation results neither does it identify the major barriers in its implementation at business level.

Study undertaken by **Oreku et al (2011)[3]**, does identify the important factors in implementation of electronic commerce however the study has been carried out in East Africa which has a very different cultural environment as compared to GCC. As there is substantial difference between east Africa and middle east on economic , social and cultural parameters hence its findings may not be applicable in this part of the world .

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Begin and Boisvert (2002)[4] analyzed strategic factors[5] that influence e-commerce implementation in Canada. They found that, like strengths and weaknesses, internal factors[6] that influence the implementation of electronic commerce activities vary between companies. When these internal factors favor the adoption of Internet technologies and their deployment within business processes, they are referred to as inductors. On the other hand, if they hinder or block the introduction of online activities, they can be described as inhibitors. Some of these factors are found at the individual level, while others exist at the organizational level. They have tried to classify the factors into groups which can serve as a good starting point to analyze these factors and identify their influence on e-commerce implementation results, however, their study does include any statistical analysis of the problems that are affecting the implementation of e-commerce.

RESEARCH PROBLEM

Despite having higher than world average in terms of internet penetration of population, GCC countries in general and Oman in particular is lagging behind in use and application of e-commerce. Some organizations have invested heavily in developing e-commerce related infrastructure as well. In line with the competitive advantage which GCC nations enjoy in certain sectors, sizable investments in e-commerce have been made, however there is substantial lack of information to identify the major problems in implementation of ecommerce solution in business enterprises.

There is few empirical data to characterize the problems in implementation of e-commerce initiatives as well as to gauge the scale of their impact on firm performance - especially in the context of Middle East Asia, partly because of the difficulty of developing measures and collecting data in this part of the world. Evidently, lack of analysis of factors that influence these results are creating uncertainty and ambiguity in the mind of middle and top level management. These are the situations which need to be investigated. The specific objective of this research is to identify and test the statistical significance of problems / obstacles faced by organizations in adopting & implementing e-commerce in GCC nations.

METHODOLOGY

For identifying the problems in implementation of e-commerce in GCC nations, a two phased process has been used. In the first phase, **SPSS 16.0 Multiple Response Analysis** techniques has been used to identify the obstacles .The **Multiple Response Analysis** command allows to analyze a number of separate variables at the same time, and is best used in situations where the responses to a number of separate variables that have a similar coding scheme all 'point to' a single underlying variable. In this research, we have considered each of the items in the question as all pointing to the fact of negatively affecting e-commerce implementation. It helps in summarizing the responses to these items at once so that we can use the pattern of responses across these items in further analysis with other variables.

In the second phase, **Hierarchical Multiple Regression Modeling (SPSS 16.0) has** been used. It is an advanced variant of the basic multiple regression procedure that allows to specify a fixed order of entry for variables in order to control for the effects of covariates or to test the effects of certain predictors independent of the influence of others. It is a form of multi-level analysis that allows variance in outcome variables to be analyzed at multiple hierarchical levels.

FINDINGS

In this part, major obstacles and barriers in the implementation of and adoption of E-commerce in GCC were analyzed. A total of 13 major obstacles were listed (identified through pilot survey in Oman) and the respondents were asked to evaluate these items using a 5-point scale. SPSS 16.0 Multiple Response Analysis yielded following five important problems affecting implementation of e-commerce. These are "concern for data security and privacy", "difficulty in integrating e-com software with the existing system", "small size of market for e-commerce", "lack of supporting business law" and "lack of skilled manpower".

Using SPSS 16.0 multiple response command, all the separate variables (multiple responses to above question) were analyzed at the same time. In the second part , Hierarchical Multiple Regression Modeling has been used to further analyze the variables to test their statistical significance.

In multiple response analysis, it has been observed that factors "concern for data security and privacy", "difficulty in integrating e-com software with the existing system", " small size of market for e-commerce", "lack of supporting business law" and "lack of skilled manpower" are the widely recognized obstacles in implementing electronic commerce in Oman . Although the five barriers have been highlighted by the respondents in the survey, but it is possible that their identification is only due to chance and it has no statistical significance. Hence further statistical analysis is required to find out their statistical significance. In order to examine the effects of these barriers on implementation of e-commerce in Oman, I have used Hierarchical Multiple Regression in SPSS. Hierarchical multiple regression, a variant of the basic multiple regression procedure that allows to specify a fixed order of entry for variables in order to control for the effects of covariates or to test the effects of certain predictors independent of the influence of others. In this hierarchical regression analysis model, the variables have been named as follows:

TABLE- 1: VARIABLE DESCRIPTION

Dependent Variables		Variable Indicator
1	E-Commerce Implementation	ecom_implmnt
Independent Variables		**Variable Indicator**
1	Lack of awareness of e-commerce	lack_awareness_ecom
2	Limited knowledge of available technology	lmt_knowledge_tech
3	Lack of confidence in benefits of ecommerce	lack_confidence_ecom
4	Cost of initial investment in adopting ecommerce	highcost_imple_ecom
5	Lack of trust between customer and company	lack_trust_cust_company
6	Insufficient infrastructure for e-commerce	infrastructure_ecom
7	Resistance in adopting ecommerce	resistance_ecom_adption
8	Low return on investment	lowreturn_investment
9	Relatively small size of market for e-commerce	small_market_ecom
10	Lack of supporting business law for ecommerce	lack_busi_law_ecom
11	Concern for data security & privacy	concern_data_ security
12	Difficulty in integrating e-commerce with existing system	difficulty_integrating
13	Shortage of skilled human resources	shortage_skilled_hr

The hierarchical regression model contains thirteen categories of independent variables (obstacles) hereafter referred as predictors. Model 1 refers to the first stage in the hierarchy when first set of predictors are included in the model.In this analysis, I have tried to find out whether the five important barriers / obstacles (identified in the multiple response analysis – the last five variables shown in above table) substantially contribute to obstacle in implementation of e-commerce in Oman. At the same time I am concerned that other variables might be associated with obstacles in e-commerce implementation. To make sure that these variables do not explain away the entire association between the above mentioned predictors and obstacles in e-commerce implementation, all other predictors (other than the five selected predictors) have been put into the first model (Model-1). This ensures that they will get "credit" for any shared variability that they may have with the predictor that I am really interested in.

Model-2 refers to the second stage in the hierarchy when predictor "Small size of market for e-commerce" is considered as contributing to obstacles in ecommerce implementation.

Model-3 refers to the third stage in the hierarchy when set of predictors "Small size of market for e-commerce" and "Lack of supporting business law for ecommerce" are considered as contributing to obstacles in ecommerce implementation.

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Model-4 refers to the fourth stage in the hierarchy when set of predictors "Small size of market for e-commerce", "Lack of supporting business law for ecommerce" and "Concern for cyber crime, data security & privacy" are considered as contributing to obstacles in ecommerce implementation.

Model-5 refers to the fifth stage in the hierarchy when set of predictors "Small size of market for e-commerce", "Lack of supporting business law for ecommerce", "Concern for cyber crime, data security & privacy" and "Shortage of skilled human resources" are considered as contributing to obstacles in ecommerce implementation.

Model-6 refers to the sixth stage in the listing when set of predictors "Small size of market for e-commerce", "Lack of supporting business law for ecommerce", "Concern for cyber crime, data security & privacy", "Shortage of skilled human resources" and "Difficulty in integrating e-commerce software with existing system" are considered as contributing to obstacles in ecommerce implementation.

The SPSS output (for Oman) in the form of Model Summary (table 2) shows the percent of "variability in the dependent variable that can be accounted for by all the predictors together (that's the interpretation of R-square). In the column labeled R are the values of the multiple correlation coefficients between the predictors and the outcome. The next column gives a value of R^2 which is a measure of how much of the variability in the outcome is accounted for by the predictors. The change in R^2 is a way to evaluate how much predictive power was added to the model by the addition of another variable in step 2. In this case, the % of variability in the outcome accounted for, went up from 4.7 % to 26 % – a substantial increase of more than 21%. The model summary in table-2 (SPSS 16.0 output) is as follows:

TABLE 2: MODEL SUMMARY [FOR OMAN]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.217[a]	.047	.102	.35455	.175	2.462	8	93	.018	
2	.429[b]	.184	.104	.35446	.009	1.048	1	92	.309	
3	.444[c]	.197	.109	.35348	.013	1.508	1	91	.223	
4	.458[d]	.210	.114	.35262	.013	1.444	1	90	.233	
5	.478[e]	.229	.125	.35041	.019	2.139	1	89	.147	
6	.510[f]	.260	.150	.34519	.031	3.712	1	88	.057	2.431

a. Predictors: (Constant), lowreturn_investment, lmt_knowledge_tech, infrastructure_ecom, lack_confidence_ecom, lack_awareness_ecom, resistance_ecom_adption, lack_trust_cust_company, highcost_imple_ecom

b. Predictors: (Constant), lowreturn_investment, lmt_knowledge_tech, infrastructure_ecom, lack_confidence_ecom, lack_awareness_ecom, resistance_ecom_adption, lack_trust_cust_company, highcost_imple_ecom, small_market_ecom

c. Predictors: (Constant), lowreturn_investment, lmt_knowledge_tech, infrastructure_ecom, lack_confidence_ecom, lack_awareness_ecom, resistance_ecom_adption, lack_trust_cust_company, highcost_imple_ecom, small_market_ecom, lack_busi_law_ecom

d. Predictors: (Constant), lowreturn_investment, lmt_knowledge_tech, infrastructure_ecom, lack_confidence_ecom, lack_awareness_ecom, resistance_ecom_adption, lack_trust_cust_company, highcost_imple_ecom, small_market_ecom, lack_busi_law_ecom, concern_data_ security

e. Predictors: (Constant), lowreturn_investment, lmt_knowledge_tech, infrastructure_ecom, lack_confidence_ecom, lack_awareness_ecom, resistance_ecom_adption, lack_trust_cust_company, highcost_imple_ecom, small_market_ecom, lack_busi_law_ecom, concern_data_ security, shortage_skilled_hr

f. Predictors: (Constant), lowreturn_investment, lmt_knowledge_tech, infrastructure_ecom, lack_confidence_ecom, lack_awareness_ecom, resistance_ecom_adption, lack_trust_cust_company, highcost_imple_ecom, small_market_ecom, lack_busi_law_ecom, concern_data_ security, shortage_skilled_hr, difficulty_integrating

g. Dependent Variable: ecom_implmnt

The Durbin-Watson statistic [5] informs about whether the assumption of independent errors is tenable. The closer to that the value is, the better, and for these data the value is 2.431, which is somewhat close to the value of adjusted R square, hence it can stated that the assumption has almost certainly been met. The next part of the SPSS output (Table-3) of this model contains an Analysis of Variance (ANOVA).

TABLE - 3: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.476	8	.310	2.462	.018[a]
	Residual	11.691	93	.126		
	Total	14.167	101			
2	Regression	2.608	9	.290	2.306	.022[b]
	Residual	11.559	92	.126		
	Total	14.167	101			
3	Regression	2.796	10	.280	2.238	.022[c]
	Residual	11.371	91	.125		
	Total	14.167	101			
4	Regression	2.976	11	.271	2.176	.023[d]
	Residual	11.191	90	.124		
	Total	14.167	101			
5	Regression	3.238	12	.270	2.198	.018[e]
	Residual	10.928	89	.123		
	Total	14.167	101			
6	Regression	3.681	13	.283	2.376	.009[f]
	Residual	10.486	88	.119		
	Total	14.167	101			

a. Predictors: (Constant), lowreturn_investment, lmt_knowledge_tech, infrastructure_ecom, lack_confidence_ecom, lack_awareness_ecom, resistance_ecom_adption, lack_trust_cust_company, highcost_imple_ecom

b. Predictors: (Constant), lowreturn_investment, lmt_knowledge_tech, infrastructure_ecom, lack_confidence_ecom, lack_awareness_ecom, resistance_ecom_adption, lack_trust_cust_company, highcost_imple_ecom, small_market_ecom

c. Predictors: (Constant), lowreturn_investment, lmt_knowledge_tech, infrastructure_ecom, lack_confidence_ecom, lack_awareness_ecom, resistance_ecom_adption, lack_trust_cust_company, highcost_imple_ecom, small_market_ecom, lack_busi_law_ecom

d. Predictors: (Constant), lowreturn_investment, lmt_knowledge_tech, infrastructure_ecom, lack_confidence_ecom, lack_awareness_ecom, resistance_ecom_adption, lack_trust_cust_company, highcost_imple_ecom, small_market_ecom, lack_busi_law_ecom, concern_data_ security

e. Predictors: (Constant), lowreturn_investment, lmt_knowledge_tech, infrastructure_ecom, lack_confidence_ecom, lack_awareness_ecom, resistance_ecom_adption, lack_trust_cust_company, highcost_imple_ecom, small_market_ecom, lack_busi_law_ecom, concern_data_ security, shortage_skilled_hr

f. Predictors: (Constant), lowreturn_investment, lmt_knowledge_tech, infrastructure_ecom, lack_confidence_ecom, lack_awareness_ecom, resistance_ecom_adption, lack_trust_cust_company, highcost_imple_ecom, small_market_ecom, lack_busi_law_ecom, concern_data_ security, shortage_skilled_hr, difficulty_integrating

g. Dependent Variable: ecom_implmnt

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Next table (Table-4) represent the last section for sixth model after the table is split into six sections: one for each model. Here it is important to note that value of F defines the accuracy of the regression model. Value of *F is* greater than 1 , may be interpreted that regression model overcomes the inaccuracy within the model and SPSS calculates the exact probability of obtaining the value of *F* by chance. For the initial model the *F*– ratio is 2.462, and **it is highly unlikely to have happened by chance** (as p < 0.05). For the second model the value of F is 2.306, which is also highly significant (p < 0.05). The value of *F*- ratio of third, fourth, fifth and sixth models are 2.238, 2.176, 2.198, and 2.376, all of which are also highly statistically significant (p < 0.05). From these results it may be safely interpreted that the final model might count as significant to predict the outcome variable.

ANOVA table reinforces our earlier findings. Here all the models predicted scores on the Dependent Variable to a statistically significant degree as the significance values of all the models is less than 0.05. The next part of the SPSS 16.0 output is concerned with the parameters of the model. Here it more important to look at the final model because it includes all predictors that make a significant contribution to predicting relationship between predictors and inefficient E-Commerce in OMAN.

In SPSS 16.0 output, Standardized Coefficients are labeled as "Beta" while the ordinary Unstandardized coefficients are labeled "B". The B values tell us about the relationship between inefficient and each predictor. If the value is positive it can tell that there is a positive relationship between the predictor and the outcome whereas a negative coefficient represents a negative relationship. Each of these beta values has an associated standard error indicating to what extent these values would vary across different samples, and these standard errors are used to determine whether or not the B value differs significantly from zero. Therefore, if the t-test associated with a B value is significant (if the value in the column labeled sig. is less than 0.05) then that predictor is making a significant contribution to the model.

Here it clear from the output that for the final model (table 4) that lack of supporting business law (lack_busi_law_ecom, t =0.471, p < 0.05), concern for data security & privacy (concern_data_ security, t =1.544, p<0.05) and difficulty in integrating ecommerce software with existing system (difficulty_integrating, t =1.927, p < 0.05) are statistically significant in terms of contribution to obstacles in e-commerce implementation in Oman.

TABLE 4: COEFFICIENTS FOR THE SIXTH (FINAL) MODEL

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
6	(Constant)	2.297	.695		3.307	.001
	lack_awareness_ecom	-.021	.049	-.047	-.432	.667
	lmt_knowledge_tech	-.113	.048	-.257	-2.334	.022
	lack_confidence_ecom	.022	.049	.050	.458	.648
	highcost_imple_ecom	-.034	.055	-.068	-.616	.539
	lack_trust_cust_company	-.092	.057	-.182	-1.627	.107
	infrastructure_ecom	-.083	.209	-.043	-.394	.694
	resistance_ecom_adption	.159	.106	.208	1.499	.137
	lowreturn_investment	-.002	.053	-.005	-.045	.964
	small_market_ecom	-.129	.104	.156	-1.230	.222
	lack_busi_law_ecom	.549	.105	.553	.471	.039
	concern_data_ security	.105	.068	.158	1.544	.026
	shortage_skilled_hr	-.137	.099	-.182	-1.393	.167
	difficulty_integrating	.163	.085	.216	1.927	.047

The standardized beta values (β) are all measured in standard deviation units and so are directly comparable: therefore, they provide a better insight into the 'importance of predictor in the model. In this model out of the five predictors, "Lack of supporting business law for ecommerce", "Concern for cyber crime, data security & privacy", and "Difficulty in integrating e-commerce software with existing system" are having positive standardized Beta values which proves that they affect the implementation of ecommerce while "Shortage of skilled human resources" and "Small size of market for e-commerce" are not that much important in contributing to obstacle in ecommerce implementation in Oman.

CONCLUSION

In the light of above analysis , it can be concluded that out of the five factors "concern for data security and privacy", "difficulty in integrating e-commerce software with the existing system", and "lack of supporting business law" are statistically significant problems in implementing e-commerce in business organizations in Oman while "Shortage of skilled human resources" and "Small size of market for e-commerce" are important but not statistically significant in contributing to problems in ecommerce implementation in Oman.

Here it is imperative to mention that as Oman is in the process of economic integration with five other Arab countries and has formed a regional trading bloc called as GCC, the process of economic integration in this part of the world continues, it offers tremendous opportunities for market expansion across the nations boundaries and this would result in better prospect for implementation of electronic commerce. This realization is already there among business managers and that precisely is the reason why business managers were reluctant to select "Small size of market for e-commerce" as a problem or obstruction in implementing e-commerce.

Concern for data security and privacy and difficulty in integration of e-commerce software with existing system are areas that require immediate and sustained attention. As one of the biggest stumbling block in implementing electronic commerce is concern fort data security and privacy, hence it is quite imperative that companies that already have privacy policies address the issue of enforcement and redress. As existing policies fail to engender customers' trust in the site, it is also recommended that companies further need to develop privacy policies that include all elements of the principle of the fair information practices.

SCOPE FOR FURTHER RESEARCH

This study is horizontal in nature and a large sample size has been used for the research hence a more in depth or vertical study with a smaller sample size may possibly give more insight into this problem. Besides this study is identifying the problems only in one of the GCC country hence for generalization, similar type of study is required covering all the six GCC nations.

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