THE IMPACT OF ERP SYSTEMS ON FIRM PERFORMANCES: CASE OF A PUBLIC SECTOR COMPANY IN SRI LANKA

G.W.K.S. Kumarasiri[1], Kumara Uluwatte[2]

[1,2]*Department of Accountancy, Faculty of Business Studies and Finance, Wayamba University of Sri Lanka*

[1]sachinikumarasiri12@gmail.com, [2]uluwatta@wyb.ac.lk

ABSTRACT

The purpose of this study is to examine how the ERP systems impact on the firm's performance in the case of a public sector organization in Sri Lanka: ACE Catering Limited with aiming to reveal how ERP systems can facilitate the organization development of new ventures and to investigate the relationships among ERP systems, firm performance and competitive advantage. The ERP system's capabilities were determined by Organizational factors, Technological factors and People factors while the firm performances were measured by overall productivity. Direct questionnaires and in-depth interviews/discussions were used to get reliable data while the inductive grounded theory approach was used to analyse the study systematically. Having selected a mixed research paradigm to guide the explanatory study of ERP systems on firm performances, data was analysed and findings were presented in both ways separately as quantitative and qualitative components. Considering results according to quantitative and qualitative analysis, the study found that people and technological factors of ERP had a statistically significant favourable influence on case-firm performances while organizational factors of ERP impact are not statistically significant on case-firm performances. As a result, a high level of people and technological factors are connected to the positive overall productivity of the case-firm. The fact that this study only considers a one particular company significantly and it may restrict how broadly the results can be applied. Nevertheless, the case study's findings indicate that the company should concentrate more on improving its people and technology aspects because they have a greater influence on overall business performance than organizational aspects. Being aware of the ERP systems would aid the accounting professionals and companies of public sector in developing countries like Sri Lanka not only to survive in the changing world but to prosper in their industry. Also, the research gives a signal to companies to move into the technological trends in the business world to survive in the market.

Keywords: ERP systems, Firm performances, Organizational factors, Technological factors, People factors

1. INTRODUCTION

Information Systems (IS) are created to deal with the interaction of people and the technology like a social system. Information systems including, Enterprise Resource Planning (ERP) systems are very important tools which are complex and comprehensive designed to integrate business process planning. Companies can increase flexibility and efficiency through ERP systems so that's why this is increasingly adopted by many companies regardless the size of the firms. According to the resources, the reason why every organization is moving into ERP systems is, it allows to save time and effort of key organizational operations. The importance of implementation of enterprise resource planning (ERP) systems for organizational strategies has been widely recognized all over the world (Presley, 2006; Wideder, 2006).

In recent years, a large number of organizations have implemented ERP systems within their context in an integrated suite of systems and information resources for their operational and management processes across a broad range of business activities (Buonanno, 2005; Ward, 2005). According to the resources, the reason why every organization is moving into ERP systems is, it allows to save time and effort of key organizational operations. As a result of that, increasingly, lots of public organizations are looking for cost effective ERP system alternatives including enhancement of internal operation management and improvement of organizational efficiency and effectiveness (Scapens R. a., 2003; Zahir, 2013).

However, when it comes to the developing countries like Sri Lanka face several challenges during the adoption, initial and post implementation of ERP systems. Although there are tremendous ERP system's benefits, many organizations still remain undecided to implement cloud ERP because of many unanswered questions It is because that management believe that that implementing to ERP may lead to an increased possibility of system slowdowns and disconnections thus hindering the organization's overall performance and efficiency (Lenart, 2011).
So, this study will be focused to assess how the ERP systems impact on the firm's performance in the case of a public sector organization as this type of studies have not been conducted in the field of public sector organizations. Therefore, this research gives a signal to companies to move into the technological trends in the business world in order to survive in the market.

Further, this study aims to examine how the ERP systems impact on the firm's performance in the case of a public sector organization by answering the following questions.

1. To examine how the company could be experientially benefited from adopting ERP systems.
2. To examine why some organizations, especially in government sector, still rejecting the implementation of ERP systems.
3. To examine how organizations use ERP in an appropriate way to be effective and efficient.

There are some significant limitations of this study which is that it is one qualitative case study only on a particular Catering service public organization and that could not be generalized for all other organizations. Sometimes, validity and reliability of the data cannot be verified due to the use of secondary data sources. Furthermore, employee's commitment, morale and emotional stability have very strong impact on the overall project so, sometimes their experience might get subjected when collecting data.

2. LITERATURE REVIEW

Over the years, Davenport (2004) stated that ERP systems bring many benefits to the organization, such as reduction of cycle time, promotion of e-commerce, and rapid generation of financial information. However, Granlund (2002), examined the effect of ERP adoption on accounting and organizational practices, and concluded that ERP systems have had no major impact on accounting systems but they found that there were many structural changes as a result of adopting the ERP system. Poston, (2001) analysed on ERP adoption and resulted that ERP adoption leads to an efficiency increase in terms of a low employee turnover.

The next section of the paper describes the theoretical context based on the conceptual framework. It goes on to present the research method and findings, followed by a discussion and conclusion.

2.1 Theoretical Review

Organizational Factors (OF)

When determining appropriate OF, it involves top management to front line subordinates, organizational structures, accordingly. The need for effective communication is a must so, it has to be in sync with the management for better understanding of the roles between superior–subordinate. Top management is required to committedly support for cloud-based ERP system with enthusiasm, providing full consideration and even continuously monitoring among all the process.

People Factors (PF)

People have been proven to be the most critical factor for any given organization therefore Umble (2002) had suggested that teamwork should be composed of cross functional members who possess decision making responsibility.

Technological Factors (TF)

Technological factors include ERP packages, IT infrastructure, data integrity and quality. Somers T. a., (2001) explored that IT infrastructure is also required for ERP operation in the form of hardware and software while Boritz (2005)

explained that data integrity is one of the critical aspects in design, implementation and usage of ERP systems through the accuracy and consistency of data over its entire lifecycle.

2.2 Empirical Review

According to the academic literature on the impact of ERP systems on organizational and accounting practices has been attracted significant attention in various ways. However, some of the literature has provided puzzling results, showing that ERP systems have limited impact on organizational practices in general (Granlund, 2002; Dechow, 2005). As per the findings of Granlund (2002), who examined the effect of ERP adoption on accounting and organizational practices, concluded that ERP systems have had no major impact on accounting systems and however, they found that there were many structural changes as a result of adopting the ERP system.

Scapens R. W. (2003) undertook a case study examining the implementation of the ERP system at the European division of a large US multinational company. Then they found that as a result of ERP implementation, significant changes occurred across different departments in the organization. Hwang Y. a.(2011) investigated the influence of cultural orientations on ERP system implementation, such as power distance and uncertainty avoidance. And, the results indicate that the ERP system implementation is influenced by the low power distance and high uncertainty avoidance.

The many of the above bespoken studies have revealed that ERP system implementation can change the way data is collected, stored, and used in organizations. However, in very few studies have shown that ERP systems have limited or no impact on organizational performances. Meanwhile, some researches on the impacts of ERP systems on financial performance has found significant evidence supporting that ERP systems enable companies to achieve faster and efficient return on investment (ROI).

3. METHODOLOGY

This study is planned to develop on case study approach by using mixed method while applying inductive research approach as it involves theory building rather than theory testing based on the grounded theory. The grounded theory was applied as it related to the inductive approach where the theory is developed based on the data which has been systematically collected and analysed. Moreover, the grounded theory aims to develop a theory from data that has been systematically collected and thoroughly examined via comparative analysis (Ylona Chun Tie, 2019). According to Creswell, (1999) two-phase design in which quantitative data is acquired and evaluated first, followed by qualitative data collection and analysis based on the quantitative results and the qualitative data serves to explain the quantitative data.

As this study was conducted by using case study approach selecting one manufacturing company, mainly data was gathered by using primary data sources. Here, surveys used as they are kind of instruments used to evaluate data quantitatively (Eysenbach, 2002). However, direct questionaries and discussions are also used in order to get reliable data as some of the variables have not been tested before as a case study. Accordingly, the research was conducted using primary data sources. Data were collected from co-workers outside of working hours using structured and un-structured interviews and direct questionaries. The staff conversations were recorded and noted down additionally for future references.

As this is a case study research, one company is selected using the Convenience Sampling Method, as the sample in order to examine the impact of ERP systems on firm performances and interviews, direct questionaries and focus group discussions (FGDs) are used to collect and analyse the result. The questionnaire was analysed through SPSS software while interviews were recorded and noted down. As such, the study is designed to use to guide the data collection and analysis which had to be flexible enough to uncover and explore the issues and concepts which potentially capable of understanding the substantive research problem.

3.1 Population and Sample

There are many companies which are using ERP systems in Sri Lanka therefore the population is somehow very large. As this is a case study research, one company is selected as the sample in order to examine the impact of ERP systems on firm performances. This is based on government sector, large sized, food processing company in Sri Lanka named “ACE catering Ltd”, which is located in Katunayake. It has nearly 700 of employees working at several departments providing 24/7 service.

In order to handle the research in a structured way, the steps in the case study were conducted following the principles of (Yin, 2003). The company was chosen in such a way that it meets some of the criteria of the previously stated principles. The organization should have adopted a new ERP system recently enough to remember the selection phase and late enough to define the ERP system's use phase (Helena Forslund, 2010).

Therefore, the company was selected as the case-firm using purposive rather than random sampling to have a better understanding on research problem ensuring that above mentioned firm would be rich enough in data related to the research topic.

Based on the conceptual framework represented in figure 1, following hypothesis were established.

H1: High level of organizational factors of ERP systems are more likely to have positive impact on firm performance (Poonam Garg, 2014).

H2: High level of technological factors of ERP systems are more likely to have positive impact on firm performance (Poonam Garg, 2014).

H3: High level of people factors of ERP systems are more likely to have positive impact on firm performance (Poonam Garg, 2014).

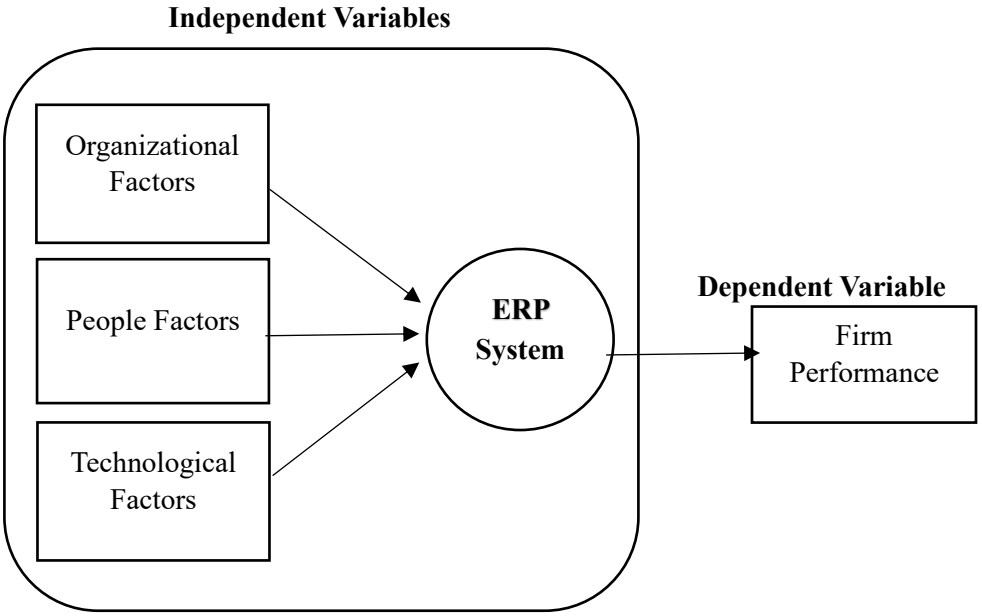

Figure 1: Conceptual Framework
Source: Authors Constructed

Here, according to the previous researches on ERP systems, there are mainly three factors which impact directly on ERP performances such as Technological factors, Organizational factors and People factor which influence the organizational performances. In this study, it appears as independent variables.

Organizational factors (OF) refer to the business plan and business process re-engineering (BPR) with greater conceptualization of goals. It was measured by considering company's Top Management Support and Effective Communication.

Technological Factors (TF) of the company includes factors such as IT infrastructure, network, hardware and software depending on the organizational structure, time constraints and complexity (Markus, 2000).

People factors (PF) are the one of the crucial factors which includes management and employees and their contribution towards the ERP projects (Ehie, 2005). In this study, it was measured using company's Team work and Training frequencies (Hwang M. I., 2018).

The both market and operational performances represents firm performances as the dependent variable. With reference to the firm performances, it illustrates both financial and non-financial performances also. But in this case, researcher focused on qualitative performances rather than quantitative performances.

3.2 Data Collection

As this study was conducted by using case study approach selecting one manufacturing company, mainly data was gathered by using primary data sources. Here, surveys used as they are kind of instruments used to evaluate data quantitatively (Eysenbach, 2002). However, direct questionaries and discussions are also used in order to get reliable data as some of the variables have not been tested before as a case study. Accordingly, the research was conducted using primary data sources.

3.3 Data Analysis

The descriptive analysis was used to understand the company's ERP systems as it uses current and historical data to identify trends. As soon as the data collection started, the researcher engaged in analysing and interpreting observed data. The data was structured and organized based on grounded understanding using grounded theory.

First phase of analysis occurred on site while in the field by exploring the impact of ERP systems as in-depth interviews was used collecting interesting responses. Recordings of interviews were also useful for later analysis. Then notes were created according to the discussions done with the participants as the second phase. Then, the questionnaire was analysed through SPSS software in order to measure the impact of ERP systems on firm performances.

4. FINDINGS AND DISCUSSION

4.1 Company Background

The case-firm, "ACE catering Ltd" produces and promotes catering service for mainly airlines as the monopoly in the market since last three decades. The company was launched in 1979 as a joint venture and then rebranded as a public limited company in 1998. The CEO of the company counts over 23 years of corporate experience in the hospitality industry in Sri Lanka and overseas. Managers and other executives are also well-experienced and passionate in area

which they entitle with. When it comes to the, company's governance, it comprises with board of directors whom governed by government regulations.

4.2 Quantitative Component of Analysis

According to the Statistical analysis (Quantitative), the multiple linear regression analysis shows that H1 is rejected by indicating insignificant impact towards the performances of the case-firm. However, both H2 and H3 are accepted indicating positive influence on firm performance.

Descriptive Analysis

The table 1 provides a summary of descriptive statistics for all demographic variables included in the model. It primarily displays the mean, median, maximum, minimum, standard deviation, skewness, and kurtosis.

Table 1: Descriptive Statistics of Demographic factors

	Gender	Job Experience	Department	Level of Employment
Mean	1.42	2.97	3.21	2.74
Median	1.00	3.00	3.00	3.00
Mode	1	3	3	3
Std. Deviation	0.496	1.211	1.697	0.897
Variance	0.246	1.465	2.879	0.804
Skewness	0.328	-0.184	0.183	-0.319
Std. Error of Skewness	0.222	0.222	0.222	0.222
Kurtosis	-1.925	-0.784	-1.078	-0.598
Std. Error of Kurtosis	0.440	0.440	0.440	0.440
Minimum	1	1	1	1
Maximum	2	5	6	4
Sum	169	354	382	326

Source: Authors Constructed

Gender's mean (average) is roughly 1.42, which is little higher than 1. This implies that, on average, there may be more of one gender in the dataset than the other. The median is 1.00, which means that half of the values are less than 1 and half are greater than 1. This suggests that the distribution is biased slightly toward higher values. The mode is 1, which is the most commonly encountered value. This indicates that one gender predominates in the sample. The standard deviation is about 0.496. This metric gauge the data's dispersion or variability. A

greater value suggests greater spread. The variance (the square of the standard deviation) is roughly 0.246.

The average for Job Experience is around 2.97. This implies that individuals have close to three years of experience on the job. The median is 3.00, which means that half of the values are less than 3 and half are greater than 3. The mode is three, which is the most common value. The standard deviation is about 1.211. This suggests that job experience varies, with some individuals having much more or less experience than the average and the deviation is around 1.465.
For the department, the median is 3.00, which means that half of the values are less than 3 and half are greater than 3. The mode is 3, indicating that this is the most commonly occurring department. The standard deviation is around 1.697. This suggests that there is some variation in the department numbers. The average level of employment is about 2.74. This is the national average for employment.

The median is 3.00, which means that half of the values are less than 3 and half are greater than 3. The mode is 3, which is the most common level of employment. The standard deviation is about 0.897. This suggests that there is some variation in employment levels and the standard deviation is around 0.804.

The skewness of a data distribution reveals its asymmetry. Positive numbers indicate a longer tail on the right side of the distribution, whereas negative values indicate a longer tail on the left side of the distribution. Kurtosis is a measure of the sharpness of the distribution's peak. Positive values indicate a flatter peak, whereas negative values indicate a steeper peak.

Regression Analysis

For the quantitative analysis, here the multiple regression analysis was conducted as the study is for testing the impact rather than testing relationship for two independent variables are being considered for bespoken hypothesis.

Table 2: Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.757[a]	0.573	0.561	0.23735
a. Predictors: (Constant), People Factors, Organizational Factors, Technological Factors				

Source: Authors Constructed

R: The correlation coefficient quantifies the degree and direction of the linear link between the predictor variables (independent variables) and the response variable (dependent variable). It is around 0.757 in this situation, indicating a relatively strong positive linear association.

The coefficient of determination is denoted as R Square (R2). It denotes the fraction of the variance in the dependent variable that can be predicted by the independent variables. In this situation, it's about 0.573, which suggests that the independent factors explain about 57.3% of the variability in the dependent variable.
Adjusted R Square: This is similar to R2, but it takes the number of predictors in the model into consideration. It has been modified to punish the addition of unneeded predictors. In this situation, it is significantly lower than R2 at around 0.561
Estimated standard deviation: This is the standard deviation of the residuals (the difference between the observed and anticipated values). It indicates how well the model matches the data. A lower value represents a better fit. It is roughly 0.23735 in this example.

Table 3: ANOVA Table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.681	3	2.894	51.366	.000[b]
	Residual	6.479	115	0.056		
	Total	15.160	118			

a. Dependent Variable: Firm Performance

b. Predictors: (Constant), People Factors, Organizational Factors, Technological Factors

Source: Authors Constructed

The Regression section of the table 3 contains information on the regression model. It demonstrates that the regression model is statistically significant as a whole. The F-value measures how well the model fits the data, and a high F-value, such as 51.366, indicates a good match. The regression model is highly significant, as indicated by the extremely low p-value (Significance) of.000.

The Residual section of the table 3 contains information about the variability that the model does not explain (i.e., the error term). The residuals have a Sum of Squares of 6.479.

The total value depicts the entire variation in the dependent variable. It is the sum of the variability explained by the model (Regression) and the variability that remains unexplained (Residual).

Overall, the ANOVA table indicates that the regression model is a strong fit for the data, since it explains a major portion of the variation in Firm Performances. People factors, organizational factors, and technological factors all have a substantial impact on firm performance.

Table 4: Coefficient Table

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	0.671	0.250		2.681	0.008	0.175	1.166
	Organizational Factors	0.086	0.082	0.104	1.054	0.294	-0.076	0.249
	Technological Factors	0.156	0.086	0.198	1.813	0.072	-0.014	0.326
	People Factors	0.425	0.069	0.527	6.138	0.000	0.288	0.563

a. Dependent Variable: Firm Performance

Source: Authors Constructed

Here as shown in the table 4, 0.671 is the constant term or the intercept. When all predictor variables are zero, this indicates the estimated value of the dependent variable (Firm Performance).

Impact of Organizational Factors of ERP on firm performance

As per the table 4, the coefficient for organizational factors is 0.086. This means that for every unit improvement in Organizational Factors, it might be expected a 0.086 unit rise in Firm Performance. The t-value of 1.054 and p-value of 0.294, however, show that this impact is not statistically significant at standard levels (e.g., p 0.05) and the coefficient's 95% confidence interval is -0.076 to 0.249.

H1: High level of organizational factors of ERP systems are more likely to have positive impact on firm performance.

As per the regression analysis, the above hypothesis is rejected by indicating insignificant impact towards the performances of the case-firm. Organizational factors included top management support and effective communication, however, the results implicated that they do not have statistically significant impact.

Impact of Technological Factors of ERP on firm performance

The coefficient for technological factors is 0.156. This means that for every unit rise in Technological Factors, it could be expected a 0.156 unit increase in Firm Performance. The t-value of 1.813 and the p-value of 0.072 indicate that this effect is statistically significant (p 0.10) and its coefficient's 95% confidence interval is -0.014 to 0.326.

H2: High level of technological factors of ERP systems are more likely to have positive impact on firm performance

This hypothesis will be accepted as it indicates somehow significancy in the analysis. IT infrastructure and Data Quality and Integrity were the main indicators for the bespoken variable and they are having positive impact to the company's performance.

Impact of People Factors of ERP on firm performance

The coefficient for people factors is 0.425. This means that for every unit improvement in People Factors, so it may expect a 0.425 unit rise in Firm Performance. The large t-value of 6.138 and the extremely low p-value (p 0.001) show that this effect is statistically significant. This coefficient's 95% confidence interval is 0.288 to 0.563.

H3: High level of people factors of ERP systems are more likely to have positive impact on firm performance

This was also accepted through analysis model as it showed positive influence in greater context.

Overall, "People Factors" appear to have the greatest influence on firm performance, followed by "Technological Factors." In this model, "Organizational Factors" do not appear to have a statistically significant effect on Firm Performance.

4.3 Qualitative Component of Analysis

When it comes to the qualitative analysis, which was done through in-depth interviews and observations, it was difficult for researcher to gather information from the CEO as he was not in the country at the time of data being collected. So, researcher had to carefully gather data from respective managers from the time being as the annual audit also had been conducted. When it comes to the usage of ERP systems department wise, it was Finance department and Procurement and Shipping department which has highest ERP usage. Therefore, researcher interviewed both Finance manager and Assistant manager of the procurement department. Considering top management support and effective communication as determinants for organizational factors, it is appeared to be insignificant to the firm performances in case-firm. According to Somers T. a., (2001), the most significant and critical success factor in ERP system has repeatedly been identified as top management support as it varies from company to company.

On the other side, as per the information gathered through interviews, it was clear that technological factors and people factors have greater impact to the ERP on the firm performances as a whole. So, the both H2 and H3 were accepted.

Company's IT department always keep in touch with the departments ensuring no downfalls and system errors happen during the office hours which enhance the

occupancy of the employee's performance. People factors are about the users of the ERP systems of the company and it is determined by training and team work in this study. Users or the employees should be given a proper training in order to mitigate any issue.

5. CONCLUSION

This study is able to examine the influence of factors of ERP system on firm performance of selected company as a case. So, the researcher decided to do a case study on this matter as it can be noticed few researches have been done in this regard. The study was mainly focused on revealing factors on how the case-firm benefited from implementing the ERP systems. As the case-firm had not previously used ERP systems, they could feel the performance change after the ERP implementation.

As the case-firm had not previously used ERP systems, they could feel the performance change after the ERP implementation. Many of the employees have spoken about that during the interview. With reference to the time saving, productivity, competitive advantage, data security and customer service, the ERP system's impact is very high. And on the other side, it helps to reduce company's operational cost within the integrated information and flexible systems procedures. As a public sector company, it is much better compared to other government-based companies as most of companies do not use ERP systems and it might be due to several reasons such as cost and needs of training.

This study outcome can be used to determine the ERP performance of any company towards its market and operational performances. According to the results of this case research, the firm can focus more on developing technological and people factors as they have more significant impact on firm performance compared to organizational factors. However, company should also pay attention to mitigate issues related to OF, as increasing the top management support and awareness. Then, the case-firm performances can be increased to a greater extent and gain competitive advantages. Apart from that, the proposed model can be used to carry out a comprehensive study with a large sample regarding ERP performances regarding various development.

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