

A STUDY ON THE IMPACT OF ERP IMPLEMENTATION IN EDUCATIONAL INSTITUTIONS

Sunil Kumar Mishra¹,

Research Scholar, Dr. A.P.J. Abdul Kalam University, Indore

Email: sunil_mishrap@yahoo.co.in

Dr. Atul Dattatray Newase²,

Research Guide, Dr. A. P. J. Abdul Kalam University, Indore

Email: dr.atulnewase@gmail.com

Pritidhara Hota³,

Assistant Professor, Global Institute of Management, Odisha

Email: phota85@gmail.com

ABSTRACT:

The introduction of the technology has made significant impact on the performance of the organisation and the communication speed with regard to quality of information across all the level of the organisation. In this paper a study has been made to evaluate the impact of the ERP implementation on the organisational performance. For this research the organisations involved in the higher education or HEI (Higher Education Institutions) Technical Institutions of Odisha. For this research the data has been collected from the various employees of the technical institutions of Odisha. Descriptive and regression analysis has been used for the analysis. The result of the analysis revealed that the implementation of the ERP has influenced the performance of the organisation to a considerably.

KEY WORDS:ERP, HEI, Organisational Performance.

INTRODUCTION:

“Enterprise resource planning (ERP), may be understood to be a software system that uses a suite of integrated applications, intended to be used for managing business processes, in an organization duly automating many back-office functions associated with technology, services and human resources. ERP, classically, integrating all the facades of operations in an organization, including product planning and development, production, marketing, sales, finance, HR, etc. using a single database, application and a common user interface.” According to (Y. Venugopala Rao, 2011), “ERP serves as a Cross-functional Enterprise Backbone that Integrates and Automates many Internal Business Process and Information Systems covering all functional areas.” According to (Davenport, 1998), “ERP comprises of a commercial software package that promises the seamless integration of all the information flowing through the company—financial, accounting, human re-sources, supply chain and customer information”.

LITERATURE REVIEW:

Higher education sector has adopted ERP system to restructure the way they operate and to integrate the key operational functions such as registration, human resource management, and financial management together. This integration will fundamentally enhance the management of resources and information flow among several key unites in the University campus (Das and Dayal, 2016). The standalone legacy systems that used to support many of the Universities administrative functions such as students' administration, scheduling, financial management, personnel management, and facilities management is currently disappearing. Even merging these scattered legacy systems into one system is not an easy task because it is costly, hard to integrate them together, and it is very challenging to make them work seamlessly (Rabaa'I, 2009).

The operation of higher education institutes is unique in nature, which contains multiple scopes, and tracks several activities related to students' administrative, human resource, and financial management. Many of the higher education institutes that adopted ERP system to streamline these activities achieve optimum efficiency, and essentially improve their overall business performance. In order to respond to the high demand of ERP system adoption by higher education institutes, ERP vendors adjust their ERP system to serve the higher education sector, which is a relatively new approach to most of the ERP system providers. The new modified ERP software now can easily fit with the Universities' unique requirements and will encourage many Universities to adopt the right ERP solution that replace the whole legacy administrative systems (Allen and Kern, 2001; Beekhuizen et al., 2002).

Many researches in literature have indicated the significant impact of ERP system on industrial sector; however, very few of them indicate the impact of ERP system on the higher education sector. The full adoption of ERP system as a complete business solution is still ambiguous to many Universities in the region, and this is due to the report of ERP failure among local and international Universities. However, various Universities have shifted from the old standalone system to the new integrated ERP solution to resolve many administrative and academic issues in case the ERP system implemented successfully. (Allen and Kern, 2001; Lawnham, 2001; Madden, 2002; Parth and Gumz, 2003; Gilbert, 2004; Rabaa'I, 2009).

The operation of higher education institutes is unique in nature and has different features such as complex objectives, outputs are hard to measure, and scattered structure of units and authority. This mixture of characteristics makes Universities unique". The end users of higher education sector are also different from other systems users because they have different education level and background, and different goals, which will distinguish the ability to use the system properly (Lockwood, 1985; Cornford and Pollock, 2004).

ERP in many Universities is under pressure to function properly and this is mainly due to the wide involvement of many factors and stakeholders such as the management of the University, administration department, system provider lecturers, students, and other end users. This unique situation urges many ERP system providers to make a system that cannot tackle several Universities' functions like finance, human resources, students' records and registration, e-learning, etc. (Seng and Leonid, 2003).

There are many challenges in higher education sector such as integration among different departments, units, and systems, which may lead to a deficiency in interdepartmental cooperation and effective communications. Difficulties to access to real-time information is another major challenge in higher education sector that may interrupt many critical decision-making processes. Agility in response time is crucial to higher education sector due to the timeframe for some operations such as class scheduling, registrations, teaching, and examinations. However, ERP system is unable to resolve many difficulties in higher education sector by hooking up all departments, units, and subsystems into a single database that operate with one entirely integrated system (Tortorella and Fries, 2015; Shatat and Dana, 2016).

Higher education sector has considered the ERP system implementation as a pathway to achieve greater integration of the scattered management information systems and overwhelm the sophisticated work flow among several departments and units. Many education institutes have invested significantly in ERP system to enhance their daily operations and achieve better academic performance (AP) (Mehlinger, 2006).

However, billions of dollars were spent on ERP system investment in the past decade, but the failure rate of the ERP implementation among the academic sector is much greater than other sectors such as manufacturing sector, banking sector, health sector, etc. (Blitzblau and Hanson, 2001; Abugabah and Sanzogni, 2010; Al Kilani et al., 2012).

The return on investment of ERP system is usually medium to high in the long run, but the cost and risks associated with ERP implementation are greater than expected. Moreover, several studies indicated that up to 80% of ERP system implementation could not deliver the expected results in the higher education sector (Mehlinger, 2006).

The education institutes suffer for several years from the legacy administrative systems that used to work independently and scattered the majority of the operational functions till the ERP system introduces the new approach that integrates various business functions into one system and single database structure (Zornada and Velkavrh, 2005; Rabaa'I, 2009).

Many of the higher education institutions are looking for a system that can demonstrate the management of large and complex computerized database that is able to store and maintain students' academic records, handle classroom scheduling, and teaching plans. This can be done by implementing technology-based solutions to maintain online applications such as online registration and grading system to serve students, faculties, and other administration (Stewart and Wright, 2005).

RESEARCH GAP:

The review of the above-mentioned literature revealed that the impact of the implementation of ERP has been studied in various areas including impact on the students, employees and other stakeholders. The studies also

spread over various parts of the countries. This led to the gap of the research in the area of local importance. Hence this research has developed based on the study of the impact of the ERP on the HEI of the Odisha.

OBJECTIVES OF THE STUDY:

To understand the existing organisational status with respect to the ERP and the impact of the ERP on the organisational performance the following objectives has been set.

- a. To explore the organisational culture with reference to the adoption of the ERP.
- b. To study the impact of the ERP to improve the organisational performance.

RESEARCH METHODS:

The success of the study depends on the appropriate methods selected for the study. Therefore, in this paper attempt has been made to adopt the suitable research methods. A well-structured questionnaire has been developed to collected the requisite data for this research. The questionnaire contains the questions intendent to collect information with respect to the existingorganisational culture, service quality, informational quality and the organisational impact due to ERP. All the questions are framed with a five-pointLikert scale.

Data were collected from the employees of the technical educational institutions across Odisha. For this purpose, 46 technical institutions are selected. Around 250 employees of these institutions were sent questionnaire, out of which only 218 valid responses were finalised for the study.

Statistical tools such as descriptive analysis and multiple regression have been used for data analysis. Before carrying out the regression analysis the normality of the depended variable and the independent variable were tested.

DATA ANALYSIS AND INTERPRETATION:

The preliminary analysis of the responses was regarding the descriptive statistics of the questionnaire collected. The important focus of the descriptive analysis was the mean values of all the individual questions. The mean value of each question represents the intensity of the responses. If the mean values are more than 3 then it indicates that the responses are more inclined towards the strongly agree point, similarly the mean value less than the 3 represents that the responses are more inclined towards the strongly disagree responses. The analysis of the descriptive statistics is presented below.

Table- I: Descriptive statistics of the Respondents

| | N | Mean | Std. Deviation | Skewness | |
|---|-----------|-----------|----------------|-----------|------------|
| | Statistic | Statistic | Statistic | Statistic | Std. Error |
| OC1 - Most employees are highly involved in their work. | 218 | 2.45 | 1.408 | .514 | .165 |
| OC2 -Decisions are usually made at the level where the best information is available. | 218 | 3.03 | 1.255 | -.208 | .165 |
| OC3 -Information is widely shared so that everyone can get information he or she needs when it is necessary. | 218 | 2.43 | 1.490 | .489 | .165 |
| OC4 - Everyone believes that he or she has a positive impact | 218 | 2.61 | 1.427 | .155 | .165 |
| OC5 - Business planning is ongoing and involves everyone in the process to some degree. | 218 | 3.06 | 1.320 | .071 | .165 |
| OC6 - Cooperation across different parts of the organization is actively encouraged. | 218 | 2.95 | 1.375 | -.123 | .165 |
| OC7 - People work like they are part of a team. | 218 | 2.98 | 1.255 | -.205 | .165 |
| OC8 - Team work is used to get work done. | 218 | 2.81 | 1.407 | .038 | .165 |
| OC9 - Teams are our primary building blocks. | 218 | 2.84 | 1.482 | .040 | .165 |
| OC10 - Work is organized so that each person can see the relationship between his or her job and the goals of the organization. | 218 | 3.01 | 1.270 | .064 | .165 |
| OC11 - Authority is delegated so that people can act on their own. | 218 | 3.04 | 1.422 | -.093 | .165 |

| | | | | | |
|--|-----|------|-------|-------|------|
| OC12 - The bench strength (capability of people) is constantly improving. | 218 | 3.28 | 1.331 | -.310 | .165 |
| OC13 - There is continuous investment in the skills of employees | 218 | 3.26 | 1.397 | -.283 | .165 |
| OC14 - The capabilities of people are viewed as important source of competitive advantage. | 218 | 3.04 | 1.447 | -.174 | .165 |
| OC15 - Problems do not arise because we have the skills necessary to do the job. | 218 | 3.24 | 1.295 | -.385 | .165 |
| SQ1 - Our ERP has accurate data | 218 | 3.15 | 1.420 | -.116 | .165 |
| SQ2 - Our ERP is flexible | 218 | 3.16 | 1.425 | -.182 | .165 |
| SQ3 - Our ERP is easy to use | 218 | 3.24 | 1.381 | -.309 | .165 |
| SQ4 - Our ERP is easy to learn | 218 | 3.06 | 1.407 | -.139 | .165 |
| SQ5 - Our ERP is reliable | 218 | 2.96 | 1.384 | -.028 | .165 |
| SQ6 - Our ERP allows for data integration | 218 | 3.22 | 1.326 | -.208 | .165 |
| SQ7 - Our ERP is efficient | 218 | 3.28 | 1.352 | -.247 | .165 |
| SQ8 - Our ERP allows customization | 218 | 3.31 | 1.289 | -.352 | .165 |
| SQ9 - Our ERP has good features | 218 | 3.32 | 1.326 | -.273 | .165 |
| SQ10 - Our ERP allows integration with other IT systems | 218 | 3.05 | 1.407 | -.082 | .165 |
| SQ11 - Our ERP meets users' requirements | 218 | 3.14 | 1.407 | -.177 | .165 |
| IQ1 - Our ERP database contents is up- to-date | 218 | 3.26 | 1.302 | -.171 | .165 |
| IQ2 - Our ERP has timely information | 218 | 3.32 | 1.298 | -.258 | .165 |
| IQ3 - The information on our ERP is understandable | 218 | 3.30 | 1.350 | -.319 | .165 |
| IQ4 - The information on our ERP is important | 218 | 3.23 | 1.369 | -.236 | .165 |
| IQ5 - The information on our ERP is brief | 218 | 3.10 | 1.416 | -.142 | .165 |
| IQ6 - The information on our ERP is relevant | 218 | 3.25 | 1.296 | -.304 | .165 |
| IQ7 - The information on our ERP is usable | 218 | 3.13 | 1.392 | -.097 | .165 |
| IQ8 - The information on our ERP is available | 218 | 3.22 | 1.398 | -.142 | .165 |
| OI1 - Our ERP reduces organizational costs | 218 | 3.55 | 1.244 | -.446 | .165 |
| OI2 - Our ERP improves overall productivity | 218 | 3.50 | 1.300 | -.493 | .165 |
| OI3 - Our ERP enables e-teaching/learning | 218 | 3.20 | 1.314 | -.308 | .165 |
| OI4 - Our ERP provides us with competitive advantage | 218 | 3.13 | 1.372 | -.061 | .165 |
| OI5 - Our ERP increases Stakeholder satisfaction | 218 | 3.23 | 1.447 | -.057 | .165 |
| OI6 - Our ERP facilitates organisational process change | 218 | 3.32 | 1.419 | -.242 | .165 |
| OI7 - Our ERP supports decision making | 218 | 3.51 | 1.310 | -.421 | .165 |
| OI8 - Our ERP allows better use of | 218 | 3.67 | 1.282 | -.717 | .165 |
| OI9 - organizational data resource | 218 | 3.38 | 1.319 | -.390 | .165 |
| Valid N (listwise) | 218 | | | | |

Source: Primary data collection.

As per the above table it is observed that out of the 15 questions intended for the organisational culture only five questions have mean value lower than 3. These questions are related to the proper information sharing among the employee and the healthy team work environment. In the next section out of 11 questions for the service quality provided by the organisation to the stakeholders almost all are having mean values more than 3. This indicates that the service quality of the organisation is good. When the informational quality of the organisations are reviewed it was found that all these questions are having a mean value of more than 3 indicating the good quality of information flow taking place in the organisation. At last, when the impact of the ERP was reviewed on the organisation it was found that all the questions have mean value 3. This indicates that there is a strong influence of ERP on the organisational development.

In the next step regression analysis has been carried out study the impact of the organisational culture, the information flow due to the implementation of the ERP and the service quality due to the implementation of ERP on the Organisational performance. For this purpose, one single representative of the organisational culture has been calculated by taking mean of all the 15 questions included in the organisational culture part. Similarly,

the representatives' other variables have calculated. Before running the regression analysis an analysis has been done to test the normality of the variable under study. This was a preliminary requirement of the regression analysis.

Table – II: Test of Normality of the variables.

| | Kolmogorov-Smirnov ^a | | | Shapiro-Wilk | | |
|----|---------------------------------|-----|------|--------------|-----|------|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| OI | .107 | 218 | .000 | .977 | 218 | .001 |
| OC | .085 | 218 | .001 | .939 | 218 | .000 |
| SQ | .089 | 218 | .000 | .977 | 218 | .001 |
| IQ | .079 | 218 | .002 | .983 | 218 | .009 |

a. Lilliefors Significance Correction

Source: Calculated from primary data.

Table- II represents the results of the normality test of the variables. It is observed from the above table that in both the test the p-values of all the variables are less than 0.05. This indicates that the null hypothesis that the variables are normally distributed has been rejected and concluded that variables are normally distributed.

In this context the variables have to be converted to normally distributed variable. For this the log of all the variable has been taken and again tested for normality. The test results of the normality of the log converted variables are presented in the table-III

Table- III: Normality test of the LOG of variables

| Tests of Normality | | | | | | |
|--------------------|---------------------------------|-----|------|--------------|-----|------|
| | Kolmogorov-Smirnov ^a | | | Shapiro-Wilk | | |
| | Statistic | df | Sig. | Statistic | df | Sig. |
| OCNormal | .065 | 218 | .026 | .987 | 218 | .045 |
| SQNormal | .063 | 218 | .035 | .992 | 218 | .277 |
| OINormal | .061 | 218 | .045 | .991 | 218 | .199 |
| IQNormal | .067 | 218 | .019 | .990 | 218 | .134 |

a. Lilliefors Significance Correction

Source: calculated from primary data.

As depicted from the table- III all the variable are having p-values more than the 0.05 mark. This indicates that the null hypothesis has been accepted and concluded that the variables under study are normally distributed and are suitable for the regression analysis.

In the next phase the regression analysis has been carried out by taking the organisational impact as the dependent variable and the organisational culture, information flow and the service quality of the organisation as the independent variable the test results are presented below. All the variables under study are taken up by the SPSS 21 software and none of them were excluded.

Table- IV: Model Summary of Regression Equation

| Model Summary | | | | | |
|---------------|-------------------|----------|-------------------|----------------------------|---------------|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
| 1 | .841 ^a | .811 | .632 | .27631 | 1.879 |

a. Predictors: (Constant), OCNormal, SQNormal, IQNormal
 b. Dependent Variable: OINormal

Sources: Regression output:

The model summary of the regression analysis represented in table- IV indicates that the r-square value of 0.811 representing that the dependent variable are explained by the independent variable to the extent of 81%. This indicates that the organisational performance has improved and affected by the independent variable to the extent of 81% by the implementation of the ERP.

Table- V: ANOVA of the Regression Analysis

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|------------|----------------|-----|-------------|-------|-------------------|
| 1 | Regression | 1.424 | 4 | .356 | 4.664 | .001 ^b |
| | Residual | 16.262 | 213 | .076 | | |
| | Total | 17.686 | 217 | | | |
| a. Dependent Variable: OINormal | | | | | | |
| b. Predictors: (Constant), OCNormal, SQNormal, IQNormal | | | | | | |

Sources: Regression output:

The ANOVA of the regression model represents the overall significance of the model. In other words, the validity of robustness of the regression is depicted by the ANOVA of the regression model. In the above table it is observed that the p-value is less than 0.05. this indicates that the regression equation is overall significant.

Table- VI: Coefficients of Regression Equation

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---------------------------------|------------|-----------------------------|------------|---------------------------|-------|------|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | .266 | .062 | | 4.293 | .000 |
| | OCNormal | .099 | .068 | .098 | 1.468 | .043 |
| | SQNormal | .220 | .080 | .196 | 2.742 | .007 |
| | IQNormal | .018 | .081 | .016 | .226 | .022 |
| a. Dependent Variable: OINormal | | | | | | |

Sources: Regression output:

The table for the coefficient of the regression analysis represents the individual impact of the independent variables on the dependent variable. The observation of the table-VI indicates that the all the independent variables are statistically significant with all p-values less than 0.05. this leads to the conclusion that all the independent variables are individually capable to influence the dependent variable. The beta co-efficient of service quality is higher than other two independent variable indicating that service quality is the most influencing factor for the organisational development. For further robustness of the data the residual statistics are given below.

Table- VII: Residuals Statistics of Regression Equation

| | Minimum | Maximum | Mean | Std. Deviation | N |
|---------------------------------|---------|---------|--------|----------------|-----|
| Predicted Value | .2877 | .7128 | .5060 | .08102 | 218 |
| Residual | -.68567 | .70289 | .00000 | .27375 | 218 |
| Std. Predicted Value | -2.695 | 2.552 | .000 | 1.000 | 218 |
| Std. Residual | -2.482 | 2.544 | .000 | .991 | 218 |
| a. Dependent Variable: OINormal | | | | | |

Sources: Regression output:

The residual descriptive of the given regression model reflects that the residual has a mean value of the zero (0). This led to the conclusion that the residuals are normally distributed. The normality of the residuals confirms the statistically significant and can be reliable for the prediction and drawing any conclusions.

CONCLUSIONS:

The analysis of the responses and the results of the statistical analysis was done with all precautions. The analysis confirms the fact that there is a lack of team work among the employees of the technical institutions. The service quality of the organisations is very good. At the same time, it was also confirmed that the informational quality to serve the stake holders have increased significantly by the implementation of the ERP. The out of the regression results have also confirmed that the service delivery quality has improved a lot after the implementation of the ERP. The organisational performance has also improved significantly after the implementation of the ERP in the technical education institutions.

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