

# Comparative Analysis Of Erp Institute Vs Non Erp Institute; Teacher Perspective

<sup>1</sup>Pranab Garg, <sup>2</sup>Dr.Himanshu Aggarwal

<sup>1,2</sup>University College of Engineering (UCoE), Punjabi University, Patiala, Punjab, India

## Abstract

It has been observed that the Non ERP institutes are lacking behind the ERP institutes. Enterprise Resource Planning (ERP) is one of the answer or solution for improving and raising the standard of the Non ERP institute. This paper describes the introduction of ERP and concentrate on the factor which leads to the better results of ERP. For analyzing the data in this paper, we have been used factor analysis of SPSS software.

## Keywords

ERP, Punjabi University (Non ERP institute), Thapar University (ERP Institute), SPSS, Teacher Perspective

## I. Introduction

ERP software for engineering institute has been designed to cover the in depth functionalities of any Educational Institute/ University/ Group of Institutions, from the perspective of various users carrying different roles and responsibilities such as Students, Teachers, Staff, Principal, Management, Parents, Alumni etc. All the data is managed in a time sensitive manner along with the rules and policies applicable at that time, so whenever required, the exact information can be re-produced as it is. The strength of ERP software increases many fold with the integration of our other ERP packages like HR, Payroll, Accounts & Inventory, Library etc. However, the entire solution is designed based on a modular approach that gives flexibility to our clients to choose desired modules as per their requirements [1]. ERP software has been developed after an in-depth analysis of the requirements of various education institutes and in close coordination with the educationists, chartered accountants and quality management personals of distinction, to help you to run all your Institute related functions in more efficient, productive and comfortable manner [3].

The primary purpose of our Education ERP is to provide mechanisms for automated processing and management of the entire institution. It reduces data error and ensures that information is managed efficiently and is always up-to-date [2]. Complete student histories for all school years, can easily be searched, viewed and reported on press of button with the help of our solution.

ERP software solution continues to serve educational institutions by developing additional programs and updating solutions with new, more efficient and customized versions that incorporate new administrative features requested by different Universities and Colleges.

## II. Why there is need of ERP Software in engineering institute [7]

- Accessing information from paper files is a difficult task
- Improper means of exchanging information between various departments
- Lack of interconnection between departments
- No quick or easy way to keep the records of students and staff error free and up-to-date
- Wastage of hundreds of hours by staff each month manually entering information or performing administrative tasks that could be handled automatically such as evaluation and generating results
- Lack of accuracy in maintaining the financial records such

as Fees, Salary and Expenses

- Lack of automation in calculating Fee balances or to find Fee defaulters
- Lack of automation for computing the staff's salary
- Lack of easy means or quick way to access old records
- Administrators spend too much time in creating Time-Table and in daily assigning the substitutes for free periods

## III. Objectives and Scope of the study

- To compare between ERP institute Vs Non ERP institute.
- To compare the knowledge about ERP from Teacher Perspective.
- To test the relevance of the ERP implementation in Non ERP institute.

In view of the certain constraints like cost and time, the study is confined to Non ERP institute such as Punjabi University and ERP institute such as Thapar University. These institutes were selected because they have extremely popular among students.

## IV. Research Methodology

### Sampling scheme

This research involves the data collection from the teachers of the selected engineering institutes. The total number of respondents in these engineering institutes, the sample size selection and application of the statistical stratified sampling technique has been followed. The details of the research methodology adopted in this research are given below: [5].

### A. For the organization

#### 1. Universe of study

Engineering institutes comprises of JSSIET,SVIET,SGGI,CU, RIMT,PUNJABIUNIVERSITY,THAPAR UNIVERSITY.

#### 2. Sample selection

NON ERP (PUNJABI UNIVERSITY) and ERP (THAPAR UNIVERSITY)

Table 1 : Sample distribution for Teachers

Organization	Teacher Level	Population	Sample
ERP 1. Thapar University	Lecturer	160	40
Non ERP 2. Punjabi University, Patiala	Lecturer	160	40
	Grand Total	320	80

### B. For the respondents

#### 1. Universe of study

all the teachers studying in these engineering institutes.

**2. Sample selection**

A number of respondents (i.e. 80) from the above Table I is selected from the two universities is selected using stratified random sampling. The primary data were collected via questionnaire-cum-interview with the selected respondents. Statistical Package for the Social Sciences (SPSS) statistical tool was used for the statistical analysis. The norms were formalized for the choice of respondents from the participating engineering institutes on the basis of detailed discussions with a number of academicians, researchers and experts. It was observed that increase in sample size will affect the results only marginally, whereas effort for it will be considerable. The sample size from a stratum was determined on the basis of the following criterion:

- 25% of the population

**C. Data collection tools**

Primary data has been collected through a questionnaire-cum-interview method from the selected respondents. The questionnaire was designed based on the literature survey, and detailed discussion with many teachers, students, researchers and industrial experts. As a result, a total of 30 relevant factors were identified that have been depicted in Table II. Further, the sensitivity of the questionnaire was found good as the liker scales were used to record the responses of the participants. The respondents were both identified at random and basis by the researchers.

**D. Processing of data**

The responses of the 40 teachers of the ERP and Non ERP of the selected engineering institutes under study were recorded on five-point liker scale with scores ranging from 1 to 5[8]. The valid responses were entered in Microsoft Excel software. Thus, this data formed was the basis for the corresponding files on the SPSS software. After that Principal Component analysis technique has been applied in the SPSS software.

Table II : Instrument for accessing alignment

Dimension	Factors
DO YOU THINK THE ERP HAS FOLLOWING BENEFITS	For reducing the paper work(F1)
	For increasing the efficiency of processes(F2)
	To facilitate timely flow of information(F3)
	To enhance the transparency in the system(F4)
	For easy availability of information (F5)
	To decrease work load and manpower requirement(F6)
	For better resource utilization(F7)
	To streamline data communication between various departments(F8)
	Set more accountability for teacher/student(F9)
	More practical orientation possible(F10)
	For reduce frauds and failure(F11)

	Internal audit possible(F12)
	Better institutional reputational(F13)
	To enhance marketing of the institute(F14)
	For employees satisfaction(F15)
	Offers a world-class atmosphere(F16)
WHAT ARE THE VARIOUS REQUIREMENTS OF ERP IN YOUR OPINION	
	Require appropriate vendor e.g. like PeopleSoft, Oracle & SAP .(F17)
	Active participation of employees and teachers .(F18)
	Total man power(including students ,teachers and administrative staff) in the college (F19)
	Healthy work culture in the University/institute/college(F20)
	Periodic training of employees. (F21)
	Require huge expenses.(F22)
	Organization restructure(F23)
AFTER IMPLEMENTING ERP WHAT ARE THE ISSUES AND CHALLENGES INVOLVED	
	ERP pose security threat(F24)
	Institute/University/college has to redesign the process (F25)
	ERP implementation require a lot of time(F26)
	Actual implemented cost is more than budgeted(F27)
	Service from the vendor side(F28)
	ERP errors result from improper user training(F29)
	To train ERP user largely depends on the user's skill set(F30)

**V. Analysis and Interpretation**

The analysis has been made on the basis of the Principal component analysis technique. The responses of the teachers of the NON ERP and ERP institutes differ in terms of their responses. In the ERP institutes, it has been observed that teachers are aware of ERP implementation. They know the advantages ,pre-requisite and the challenges involved in the ERP because they have already using ERP in their institute practically .But in the case of Non ERP institutes, it has been found that teachers know about ERP theoretically only. They know some parts of benefits, requirements and issues and challenges involved in ERP. In nut shell, we can also say ERP institute teachers know the practical and theoretical aspect of ERP but Non ERP institute teachers know the theoretical aspect

of ERP. The above statement can be explained on the basis of factor analysis also, which is discussed below. The collected responses were subjected to the factor analysis technique to identify and pinpoint the most important factors for alignment. Principal component analysis and varimax rotation of factor analysis techniques were applied to extract the most important sub-objective and the underlying factors. These have been shown in tables 3-8. Table with the '\*a' indicate responses of the teachers of Non ERP institute and '\*b' is responses of the teachers of ERP institutes. SPSS Output 1 shows the table of descriptive of ERP and Non ERP institute. In the Table III\* (a) Non ERP, it has been found that the mean lies between 2.97 and 3.75 where as standard deviation is above .5 to 1.3. Similarly for Table III\*(b) ERP institute, mean is 4 to 4.67 and standard deviation is below .8. SPSS Output 2 shows the table of communalities before and after extraction. On the basis of the Table IV\*(a), communalities, 11.2% of the variance associated with Q1 is common. Table IV\*(b), communalities, we can say that 12.2% of the variance associated with Q1 is common. It can be observed from Table V\*(a) that these principal components explain 43.01% of the cumulative variance. These three components have been shown in Table VII\*(a) along with the underlying 25 variables bearing factor loading more than 0.5. These are very important according to the students of Non ERP institute. On the other hand in the output of the ERP institutes, on the basis of the Table V\*(b) that these principal components explain 37.30% of the cumulative variance. These three principal components have been shown in Table VII\*(b) along with the underlying 15 variables bearing factor loading more than 0.5. These are very important according to the students of ERP institute. The next step is to look at the content of questions that load the same factor to try to identify common themes. From the Table VII\*(a) and VIII\*(a), the questions that load highly on factor 1 and 3 seem to all relate to prerequisite and advantages, therefore we might label this factor needs and benefits of ERP. The questions that load highly on the factor 2 all seem to relate to threats; therefore, we might label this factor issues and challenges of ERP. In the same way from Table VII\*(b) and VIII\*(b), three factors are extracted. The questions that load highly on factor 1 seem to all relate to needs, and drawbacks. Therefore, we might label this factor threat and essentials of ERP. Also for the factor 2 relate to benefits, needs and threat of ERP and factor 3 relate to be advantages and threat of ERP.

## VI .Conclusion

From the teacher perspective, it has been observed that teachers of ERP institute know the both sides of ERP ie Theoretical and Practical. This is the result of awareness generated by the institute regarding ERP. Also, they have studied about ERP in their research work or seminars. When we talk about Non ERP institute, the marginal difference in response from ERP institute is result of individual studies carried out by them. But due to lack of resources or knowledge, the institute has not implemented it. So the teachers have not got the practical knowledge about ERP.

## References

- [1] Ellen Monk, Bret Wagner.(Ed). "Concepts in Enterprise Resource Planning"; Course Technology, 2005
- [2] Thomas F. Wallace, Michael H. Kremzar. .(Ed). "ERP: Making It Happen"; Wiley, 2001
- [3] Daniel E. O'Leary. (Ed). "ERP Systems: Systems, Life Cycle, E-commerce, and Risk";Cambridge University Press,

2000

- [4] Siriginidi S. R., "Enterprise Resource Planning in re-engineering business", Business Process Management Journal, Vol. 6 (5), pp. 376-91, 2000.
- [5] Rao S. S., "Enterprise Resource Planning: business needs and technologies", Industrial Management and Data Systems, Vol. 100 (2), pp. 81-86, 2000.
- [6] Singla, Ashim.Raj" Impact of ERP Systems on small and mid sized Public Sector Enterprises", International Journal of Theoretical and Applied Information Technology, Vol. 4, No. 2, pp119-131, 2008
- [7] Singla,Ashim.Raj.(Ed). "Enterprise Resource Planning Systems". Ghaziabad CENGAGE Learning, 2008.
- [8] Kothari, C.R.(Ed). "Research Methodology".Jaipur:NewAge International limited, 2008



Pranab Garg is a student of M.Tech in Computer Science at University College of Engineering, Punjabi University, Patiala. He holds a B.Tech degree in Computer science from Bhai Gurdas engg college, Punjab Technical University, Jalandhar. His research interests are software management, Software engineering, computer net works, data mining,



Dr. Himanshu Aggarwal, Ph.D., is Associate Professor in Computer engineering at Punjabi University, Patiala. He has more than 18 years of teaching experience and served academic institutions such as Thapar Institute of Engineering & Technology, Patiala, Guru Nanak Dev Engineering College, Ludhiana and Technical Teacher's Training Institute, Chandigarh. He is an active researcher who has supervised many M.Tech. Dissertations and contributed 40 articles in various Research Journals and Conferences. He is on the Editorial Board of several Journals of repute. His areas of interest are Information Systems, ERP and Parallel Computing.

**APPENDIX****Enterprise Resource Planning Survey Questionnaire**

Please take a few minutes to fill out this survey on the timeliness and quality of the service you received today. Welcomes your feedback and your answers will be kept confidential. Please complete this survey and return it to Pranab Garg (Research Scholar, M.Tech-2nd C.E) in UCOE Dept, Punjabi University, Patiala. In this questionnaire 1 means – strongly disagree , 2 – disagree ,3 – neutral, 4 – agree, 5 – strongly agree.

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<b>DO YOU THINK THE ERP HAS FOLLOWING BENEFITS</b>					
For reducing the paper work					
For increasing the efficiency of processes					
To facilitate timely flow of information					
To enhance the transparency in the system					
For easy availability of information					
To decrease work load and manpower requirement					
For better resource utilization					
To streamline data communication between various departments					
Set more accountability for teacher/student					
More practical orientation possible					
For reduce frauds and failure					
Internal audit possible					
Better institutional reputational					
To enhance marketing of the institute					
For employees satisfaction					
Offers a world-class atmosphere					
<b>WHAT ARE THE VARIOUS REQUIREMENTS OF ERP IN YOUR OPINION</b>					
Require appropriate vendor e.g. like PeopleSoft, Oracle & SAP.					
Active participation of employees and teachers .					
Total man power(including students ,teachers and administrative staff) in the college					
Healthy work culture in theUniversity/institute/college					
Periodic training of employees.					
Require huge expenses.					
Organization restructure					
<b>AFTER IMPLEMENTING ERP WHAT ARE THE ISSUES AND CHALLENGES INVOLVED</b>					
ERP pose security threat					
Institute/University/college has to redesign the process					
ERP implementation require a lot of time					
Actual implemented cost is more than budgeted					
Service from the vendor side					
ERP errors result from improper user training					
To train ERP user largely depends on the user's skill set					

Table : III\*(a)Mean and Standard Deviation (Non ERP)

	Mean	Std. Deviation
F1	3.2500	.58835
F2	3.4750	.78406
F3	3.4750	.90547
F4	3.3500	.76962
F5	3.6500	.69982
F6	3.6250	.70484
F7	3.6250	.74032

F8	3.7500	.77625
F9	3.6250	.92508
F10	3.3250	1.04728
F11	3.6500	.86380
F12	3.5000	.90582
F13	3.6750	.88831
F14	3.6500	.73554
F15	3.5250	.78406
F16	3.6750	.82858
F17	3.6500	.92126
F18	3.4000	.74421
F19	3.4250	.78078
F20	3.4000	.59052
F21	3.3500	.92126
F22	3.4500	1.03651
F23	3.5750	1.00989
F24	3.0500	1.31948
F25	2.9750	1.12061
F26	3.1750	.84391
F27	3.3000	.88289
F28	3.3250	1.09515
F29	3.0250	1.09749
F30	3.0000	1.06217

Table 4 (a) : Communalities (Non ERP)

	Initial	Extraction
F1	1.000	.112
F2	1.000	.395
F3	1.000	.369
F4	1.000	.474
F5	1.000	.348
F6	1.000	.391
F7	1.000	.396
F8	1.000	.416
F9	1.000	.636
F10	1.000	.336
F11	1.000	.403
F12	1.000	.289
F13	1.000	.463
F14	1.000	.521
F15	1.000	.328

F16	1.000	.326
F17	1.000	.592
F18	1.000	.484
F19	1.000	.310
F20	1.000	.396
F21	1.000	.438
F22	1.000	.238
F23	1.000	.409
F24	1.000	.733
F25	1.000	.742
F26	1.000	.528
F27	1.000	.444
F28	1.000	.429
F29	1.000	.392
F30	1.000	.569

Extraction Method: Principal Component Analysis.

Table 5 : \*(a) Total Variance Explained (NON ERP)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.961	19.871	19.871	5.961	19.871	19.871
2	4.513	15.043	34.914	4.513	15.043	34.914
3	2.431	8.104	43.018	2.431	8.104	43.018
4	2.273	7.578	50.596			
5	1.759	5.863	56.459			
6	1.610	5.366	61.825			
7	1.546	5.153	66.979			
8	1.307	4.357	71.336			
9	1.151	3.835	75.171			
10	.987	3.291	78.462			
11	.942	3.139	81.601			
12	.802	2.674	84.275			
13	.749	2.497	86.772			
14	.606	2.021	88.793			
15	.506	1.686	90.479			
16	.450	1.499	91.977			
17	.428	1.427	93.404			
18	.378	1.260	94.664			
19	.269	.896	95.560			
20	.264	.879	96.439			
21	.225	.750	97.189			
22	.215	.718	97.907			
23	.154	.513	98.420			
24	.148	.494	98.914			
25	.103	.342	99.256			
26	.082	.275	99.530			
27	.061	.203	99.734			
28	.045	.149	99.883			
29	.025	.085	99.968			
30	.010	.032	100.000			

Table 6(a) : Component Matrix (Non ERP)

	Component		
	1	2	3
F9	.794		
F17	.734		
F24	.708		
F4	.688		
F25	.645	-.565	
F20	.597		
F10	.530		
F12	.528		
F18	.525		
F30		-.634	
F28		-.617	
F8		.585	
F27		-.584	
F14		.562	
F13		.538	

F26		-.526	
F2			.606
F21			.575
Extraction Method: Principal Component Analysis.			
a. 3 components extracted.			

Table 6(b) : Component Matrix (ERP)

	Component		
	1	2	3
F23	.755		
F28	.755		
F19	-.647		
F21	.640		
F26	.640		
F25		-.834	
F30		-.834	
F18		.559	
F9		.548	
F6		.536	
F7			.581
F22	.511		.536
F27	.511		.536

Extraction Method: Principal Component Analysis.

a. 3 components extracted.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.182	13.940	13.940	4.182	13.940	13.940
2	3.825	12.750	26.690	3.825	12.750	26.690
3	3.183	10.611	37.301	3.183	10.611	37.301
4	2.814	9.380	46.681			
5	2.243	7.477	54.158			
6	1.999	6.664	60.822			
7	1.767	5.889	66.711			
8	1.439	4.796	71.507			
9	1.211	4.038	75.545			
10	1.141	3.802	79.346			
11	.985	3.284	82.630			
12	.900	3.001	85.631			
13	.764	2.547	88.178			
14	.623	2.078	90.256			
15	.572	1.908	92.164			
16	.538	1.794	93.958			
17	.453	1.511	95.469			
18	.334	1.113	96.582			
19	.240	.800	97.382			
20	.223	.744	98.126			
21	.157	.523	98.649			
22	.139	.462	99.111			
23	.104	.348	99.458			

24	.098	.328	99.786			
25	.064	.214	100.000			
26	.000	.000	100.000			
27	.000	.000	100.000			
28	.000	.000	100.000			
29	.000	.000	100.000			
30	.000	.000	100.000			
Extraction Method: Principal Component Analysis.						

Table 6\*(b) : Component Matrix (ERP)

	Component		
	1	2	3
F23	.755		
F28	.755		
F19	-.647		
F21	.640		
F26	.640		
F25		-.834	
F30		-.834	
F18		.559	
F9		.548	
F6		.536	
F7			.581
F22	.511		.536
F27	.511		.536

Extraction Method: Principal Component Analysis.  
a. 3 components extracted.

Table 7\*(b) : Rotated Component Matrix(ERP)

	Component		
	1	2	3
F26	.848		
F21	.848		
F28	.835		
F23	.835		
F25		-.886	
F30		-.886	
F6		.610	
F17		.549	
F18		.543	
F4			.711
F7			.606
F22			.603
F27			.603
F29			.524
F24			.524

Extraction Method: Principal Component Analysis.  
Rotation Method: Varimax with Kaiser Normalization.



Table 8(b) (ERP)

Factor 1,the variables comes under threat and essentials of ERP	
F26	ERP implementation require a lot of time
F21	Periodic training of employees
F28	Service from the vendor side
F23	Organization restructure
Factor 2,the variables comes under benefits, needs and threat of ERP	
F25	Institute/University/college has to redesign the process
F30	To train ERP user largely depends on the user's skill set
F6	To decrease work load and manpower requirement
F17	Require appropriate vendor e.g. like PeopleSoft, Oracle & SAP
F18	Active participation of employees and teachers
Factor 3 ,the variables comes under advantages and threat of ERP	
F4	To enhance the transparency in the system
F7	For better resource utilization
F22	Require huge expenses
F27	Actual implemented cost is more than budgeted
F29	ERP errors result from improper user training
F24	ERP pose security threat