EVALUATION OF ERP BASED LEARNING EFFECTIVENESS AND IMPROVED FEEDBACK MECHANISM USING ARTIFICIAL NEURAL NETWORK

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Abstract
The innovation of Information Technology enhances the organizational growth and performance through various end-to-end connectivity. Enterprise Resource Planning attempts to integrate all the departments across the educational institution and is one of the fastest growing segments in academic domain. There are enormous learning methodologies found in Indian educational system and there is no proper feedback mechanism available for the students to project their views. Now a day's social media like Facebook and twitter are the best mean of projecting the feedback and it is easily reachable across the student's generation.

This research work is mainly focused on the evaluation of the present learning methodologies, the evaluation of ERP based learning using various adopted parameters and focused on the common feedback mechanism using Facebook and Twitter and the projection and end results can be captured automatically using the implementation or training of rules through artificial neural networks.

The live data from the students can be captured through Twitter and the evaluation of adopted learning ERP can be done using Big Data analytics and the artificial neural networks will share the comments towards the learning pattern.

Keywords: Enterprise Resource Planning, Artificial Neural Networks, Big Data Analytics.

Introduction
Recently, Higher education is always influencing by various technologies and governed to improve their efficiency and performance. The Competitive educational environment increased the pressure and the expectation from students of various engineering colleges across the world. The government has not provided enough support for the adoption of new technology based education and to enhance new strategies to improve the educational performance. Because of the same, the higher education sector has migrated to Enterprise resource planning (ERP) based systems in helping them to cope up with this growing environment. Information and communication technology (ICT) available in our environment helps us to grow predominantly in the educational sector.

The opportunity that makes huge profits from Information Communication Technology was first perceived by various manufacturing industries. Today, the academic environment is aware of the advantages and disadvantages of Information and Communication Technology too. Not only from education and research perspectives, but also from the business scenario, which uses Information Communication Technology to support the other business functionalities like administrative, organizational and accounting sectors?

The increasing number of colleges or higher education institutions has evolved with ERP systems implementation to improve their operations and make them manageable and more transparent and bring high efficiency. ERP vendors are also aware of this fact, which is the reason that they already expanded their solutions to satisfy the needs of higher education institutions or any academic domain.

The main aim of ERP implementation in universities is to provide schools and colleges with an increased ability for research and teaching at the reasonable and low cost. An ERP is an Enterprise Resource Planning system - a software system that processes institution-wide transactions on a single software system and a single data base.

These multi-functional systems are designed to streamline almost every aspect of how institutions operate. Simply put, an ERP integrates institutional data and processes through one system. Because of the same, the higher education sector has moved to Enterprise resource planning (ERP) systems in the hope of helping them to cope with this changing environment.

Consequently, the existing administration and management computer systems have been replaced with ERP in the educational organizations to improve the performance of the end users by providing better managerial tools.

The main aim of ERP implementation in universities is to provide schools and colleges with an increased ability for research and teaching at the reasonable and low cost. Its main objective is to analyze what role the ERP system plays in educational organizations and how it is helpful for them. An ERP is an Enterprise Resource Planning system -- a software system that processes institution-wide transactions on a single software system and a single data base.

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ERP System Benefits and Limitations
The present ERP implementation in colleges or any sort of higher educational institutions have certain benefits as well as limitations. The various benefits that ERP implementation in academe are its effective cost, organization of data in a better and best possible way, highly secure data, automatic administration with less human intervention, the management process is quick and highly efficient, focus towards the educational objectives and improved efficiency. Similarly, the limitations of implementing the ERP in academe are implementation cost is too high, ERP packages are difficult to learn and implement.

Software Components of an ERP
In higher education, the major software components, or modules, of an ERP consist of one or more of the following: Human Resources, Payroll, Finance, Purchasing, Asset, Management, Grants, Travel & Expenses, Student Information, Student Account Receivables, Financial Aid, and Advancement. Many software companies sell ERP software within the higher education market. The most prominent providers include the following: 1. SunGard Higher Education 2. Oracle 3. SAP 4. Datatel

Steps Involved In ERP Implementation
Implementing an ERP system is a major task for the educational organizations. Some of the steps which are required to be followed while implementing ERP system in an educational organization are mentioned below:
1. Providing the business case for the ERP- The leadership of the institution will need to provide the rationale and make the business case for an ERP. For many educational organizations, implementing an ERP is used to implement important components of the institution's strategic plan.

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2. Assessment of the Readiness of the Institution- By carrying out a readiness assessment, an institution will be able to determine its "preparedness," to identify potential roadblocks, and to begin helping the organization understand the ERP project and overall benefits.

3. Preparation for Vendor Selection- To prepare for selecting the best vendor for your institution, the functional offices will document current business practices and determine the features required of a new software system. This list is commonly called the ERP system software requirements.

4. Selection of Vendor- Running the selection process as a project itself provides a structured process for choosing your technology partners, both the ERP software that best fits your institution's needs, as well as the technology firm you will use to configure and implement the software.

5. Planning of the Implementation. Using proven project management methodologies, tools, and techniques, your institution will prepare for a successful implementation by developing a comprehensive project plan and schedule. At this step, an experienced project manager can guide you through the hundreds of tasks that must be scheduled, tracked, and controlled throughout the project.

6. **Implementation of the ERP Solution.** The actual implementation will be the longest and most expensive step in the ERP journey. In this step, both monetary and personal efforts will be spent in carrying out the necessary work to implement your new software over a multi-year period.

7. The expenses and risks involved in implementing educational organizations are very high, but it is believed that integral information solutions give higher education institutions competitive advantages.

Research Model

This research model is proposed with the consideration of five major parameters namely reliability, responsiveness, empathy, assurance and tangibility. It is meant to be a SERVQUAL model.

Fig 1: SERVQUAL Model

The base questionnaire is prepared on the aspect of SERVQUAL model and it is filled by the student's community of various engineering colleges in Tamilnadu.

There have been numerous studies on ERP implementation and several related issues such as implementation procedures, business process and outcomes. Although these studies discuss many

important issues in detail, even vendor selection and implementation team, research about ERP system in higher education is still at the infancy stage. Indeed, existing ERP research has neglected the higher education sector worldwide, even though most universities have implemented or are in the process of implementing an ERP system.

Thus, research in issues related to ERP and users in higher education represents a forward step in analyzing the actual benefits potentially brought by these systems to organizations. Although ERP systems in higher education institutions currently represent their largest software investment, it is not likely to be the final one.

Interpretation and Results

We have collected the data from 400 respondents among which 334 response from students, 29 response from teachers, 8 response from managers and 29 response from non-teaching faculty members of various engineering colleges. The feedback has been categorized as illustrated in the below table.

Table 1. Sampling Data Set.

User Types	Respondents
Managers	8
Students	334
Teachers	29
Others	29
Total	**400**

There are two different hypotheses followed in our research model namely the null hypothesis where the there is no relationship between the ERP integration and the academic improvement. The second hypothesis is that there is always a relationship exist between the ERP integration and the academic improvement and efficiency.
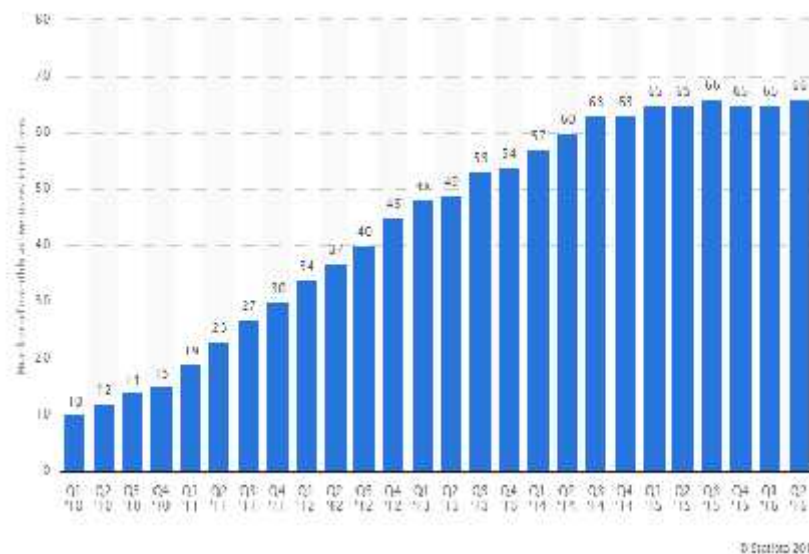

Figure 2: Statistical Data through Sampling

The above picture clearly visualizes the growing rate of Twitter Users across the world and that is the biggest key to be considered for the student's feedback mechanism in which the real-time data analytics is done. The data have been integrated through System Application and products in data processing (SAP) to be evolved.

Table 2. Chi Square Test Result and Statistics.

Chi-Square Test

Experience			
	Observed N	Expected N	Residual
	33	48.5	-18.5
	67	48.5	18.5

Test Statistics

	Experience
Chi-Square	14.113[a]
Df	1
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 48.5.

From the above table, it is evident that the value of Df is optimized. The variance of the output through Chi-square test is calculated to be 14.113 and both the hypothesis were applied and get the same result in positive sign for the null hypothesis and negative sign for the alternate hypothesis.

Table 3. Test of Homogeneity of the Variances

Descriptive

	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
				Lower Bound	Upper Bound		
Strongly Agree	1.3750	.50000	.12500	1.1085	1.6414	1.00	2.00
Strongly Disagree	2.0000	.00000	.00000	2.0000	2.0000	2.00	2.00
Total	1.5000	.51299	.11471	1.2599	1.7401	1.00	2.00

The test of homogeneity of the variances have been calculated with respect to the below five parameters taken into the consideration.

1. Strongly agree.
2. Agree.
3. No Reply / Neutral.
4. Disagree.
5. Strongly Disagree.

These five parameters have been considered for all the relative questions and the response have been taken from the students. Teaching and non-teaching faculty members.

The Chi-square test has been performed with the difference between correlation and the mean deviation. The Pearson chi-square result always shows the depicted value is higher than the likelihood ratio. The values of the Pearson's chi-test result are depicted in the below table.

Table 4: Pearson's Homogeneity of Variance

	Value	Df	Asymp. Sig. (2-Sided)	Exact Sig. (2-Sided)	Exact Sig. (1-Sided)
Pearson Chi-Square	5.491[a]	1	.010		
Continuity Correction [b]	4.636	1	.19		
Likelihood Ratio	5.317	1	.01		
Fisher's Exact Test				0.19	.008
Linear-by-Linear Association	5.548	1	.011		
N of Valid Cases	128				

Conclusion and Future Work

The benefits and impacts provided by ERP systems need a rigorous evaluation. Most existing evaluation studies of ERPs focus on technical issues or implementation processes, the benefits and impacts provided by ERP systems need a rigorous evaluation. Most existing evaluation studies of ERPs focus on technical issues or implementation processes, these do not provide an explanation about ERPs effects, or if ERPs work well or poorly with a specific user in a setting.

Thus, evaluating the most critical factors that potentially determine the impacts from these systems is highly desirable to explain the actual benefits that could be achieved through these systems by users and organizations since they could affect educational outcomes and delivery. The omission of a comprehensive model to evaluate the impacts of IS and its dimensions on user performance is still as an inherent problem in the IS field. This renders imperative the need for a sound academic study especially in higher education organizations, which increasingly invest daily in ERPs to improve performance and outcomes. Similarity based on this literature review the analysis of user aspects has been absent due to a lack of conceptual frameworks, complexity of the sector, and complexity of the relationships between ERP systems and performance has said previously. In brief, demonstrating the benefit and impacts of ERPs is becoming unavoidable from both academic and practical perspectives, because on individual

performance, the high costs of these applications and the effects on educational services and outcomes. Its main objective is to analyze what role the ERP system plays in educational organizations and how it is helpful for them. ERP systems are the largest software applications adopted by most of the educational organizations along with some investments in their implementation. However, less research activities have been done regarding the ERP systems in a university environment. An increasing number of higher education institutions have introduced ERP systems to improve their operations and make them manageable and more transparent. ERP vendors are also aware of this fact, which is the reason they have already expanded their solutions to satisfy the needs of higher education institutions.

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