"A study of Educational ERP system model for Technical and Medical Educational Institutes in Pune District"

A Thesis Submitted to

Tilak Maharashtra Vidyapeeth, Pune

For the Degree of

Doctor of Philosophy (Ph.D.)

Under the Faculty of Management

By

Mr. Balasaheb N. Bhamangol

Under the Guidance of
Dr. Vilas D. Nandavadekar

November- 2013

Declaration by the Candidate

I hereby declare that the thesis entitled **"A study of Educational ERP system model for Technical and Medical Educational Institutes in Pune District"** completed and written by me has not previously formed the basis for the award of any Degree or other similar title upon me of this or any other University or examining body.

I further declare that the material obtained from other sources has been acknowledged in the thesis.

Mr. Balasaheb N. Bhamangol
(Research Student)

Place: Pune
Date:

Certificate of the Guide

This is to certify that the thesis entitled **"A study of Educational ERP system model for Technical and Medical Educational Institutes in Pune District"** which is being submitted herewith for theaward of the **Degree of Philosophy (Ph.D.) in Management** of Tilak MaharashtraVidyapeeth, Pune, is the result of original research work completed by **Mr. Balasaheb Ningappa Bhamangol**, under my supervision and guidance.

To the best of my knowledge and belief the work incorporated in this thesis has notformed the basis for the award of any Degree or similar title of this or any otherUniversity or examining body upon him.

Dr. Vilas Dattu Nandavadekar
(Research Guide)

Place: Pune
Date:

Acknowledgement

I owe my personal thanks to **Prof. M.N. Navale** (Founder President, STES) for hiswhole hearted support, motivation and inspiring encouragement.

I would like to express my gratitude to **Dr. Vilas D. Nandavadekar**, Director SIOM(MCA), Vadgaon (Bk.), Pune-41, for his encouragement and continuing supportthroughout my research work. Under his expert guidance I have completed mydoctoral research on the topic "**A study of Educational ERP system model for Technical and Medical Educational Institutes in Pune District**".This study would have remained incomplete without his expert guidance andencouragement.

I am also grateful to **Dr. Deepak J. Tilak** (Vice-Chancellor, Tilak MaharashtraVidyapeeth, Pune) and **Dr. Umesh Keskar** (Registrar, Tilak Maharashtra Vidyapeeth,Pune) for their encouragement and support in this endeavor.

I will fail in my duty if I forget to thank **Dr. R. N. Dhamdhere,Dr. Daniel Panker**, **Dr. Shivaji U. Gawade, Dr. Shivaji D. Mundhe**, **, Dr. R. G. Pawar, Prof. Sunil Khilari,Prof. Tanaji Dabade, Dr. (Mrs) Manisha Kumbhar and Mrs. Vidya Gavekar** for their timely guidance and valuable inputs.

I would also like to acknowledge all faculties and students, Technical and Health Science Institutes employees and students of the sample who have given me the required information.

Above all, I would like to thank my family members- my Wife, **Mrs. Bharati Balasaheb Bhamangol,** my father **Mr. Ningappa B. Bhamangol**, mother **Mrs. Bhagirati Bhamangol,** brothers**Mr. Vitthal Bhamangol, Mahesh Bhamangol,** father in Law **Mr. Mohan N. Narute** and mother in Law **Mrs. Shamal M. Narute** and my son and daughter **Aumkar** and **Aarya**.Their support and tolerance has proved of great help in the fulfillment ofthis mammoth task.

Mr. Balasaheb N. Bhamangol

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TERM REFENCE

In the present report/thesis the word/term “Health Science” wherever is used is to be treated/considered as “Medical”.

In the present report/thesis the word/term “Legacy” wherever is used is to be treated/considered as “Existing”.

Abbreviations

EERP	Educational Enterprise Resource Planning
ERP	Enterprise Resource Planning
IT	Information Technology
ICT	Information communication Technology
CSF's	Critical Success Factors
MIS	Management Information System
AICTE	All India Council for Technical Education
DTE	Directorate of Technical Education
IaaS	Infrastructure as a Service
PaaS	Platform as a Service
SaaS	Software as a Service
UID	Unique Identification Number
SSN	Social Security Number
WS	Web Services
UDDI	Universal Description Discovery and Integration
SOAP	Simple Object Access Protocol
BI	Business Intelligence
IDS	Intrusion Detection Systems
WSDL	Web Services Description Language
SRM	Students Relation Management
SOA	Service Oriented Architecture
IPS	Intrusion protection system
DR	Disaster Recovery
DM	Disaster Management
NIST	National Institute of Standards and Technology
UL	Level of University

Glossary

1. **BI (Business Intelligence):** is a set of theories, methodologies, architectures, and technologies that transform raw data into meaningful and useful information for business purposes.
2. **CSF's (Critical Success Factors):** are those few things that must go well to ensure **success** for a manager or an organization, and, therefore, they represent those managerial or enterprise area, that must be given special and continual attention to bring about high performance
3. **EERP (Educational Enterprise Resource Planning):** **i**s a education management software - usually a suite of integrated applications, that a institute can use to collect, store, manage and interpret data from many activities, including: - Admission Process, Fees, Attendance, Student, Exam etc. Management System
4. **IaaS (Infrastructure as a Service):** is a provision model in which an organization outsources the equipment used to support operations, including storage, hardware, servers and networking components.
5. **IDS (Intrusion Detection Systems):** is an active process or device that analyzes system and network activity for unauthorized entry and/or malicious activity. The way that an IDS detects anomalies can vary widely; however, the ultimate aim of any IDS is to catch perpetrators in the act before they do real damage to resources.
6. **IPS (Intrusion protection system):** is also known as **intrusion detection and prevention systems** (**IDPS**), are network security appliances that monitor network and/or system activities for malicious activity. The main functions of intrusion prevention systems are to identify malicious activity, log information about this activity, attempt to block/stop it, and report it.
7. **PaaS (Platform as a Service):** is a category of cloud computing services that provides a computing platform and a solution stack as a service.
8. **SaaS (Software as a Service):** is a software licensing and delivery model in which software is licensed on a subscription basis and is centrally hosted on the cloud by independent software vendors or application service providers. It is sometimes referred to as "service as a software substitute".
9. **SOAP (Simple Object Access Protocol):** is a protocol specification for exchanging structured information in the implementation of web services in computer networks. It relies on XML Information Set for its message format, and usually relies on other application layer protocols, most notably Hypertext Transfer Protocol (HTTP) or Simple Mail Transfer Protocol (SMTP), for message negotiation and transmission.
10. **SOA (Service Oriented Architecture):** is a software design and software architecture design pattern based on distinct pieces of software providing application functionality as services to other applications.
11. **UID (Unique Identification Number):** is a unique identification number later renamed as Aadhar number which is used to create a unique ID for every Indian resident.

CHAPTER 1
INTRODUCTION

1.0 INTRODUCTION

ERP systems are integrated, enterprise-wide, packaged software applications that impound deep knowledge of business practices accumulated from vendor implementations to manage an organization's resources. The ERP systems are composed of various modules which integrate business management and administrative functions including human resources, accounts payable, purchasing, finance and student system. It provides cross organizational integration of data through imbedded business processes which is very vital for Higher Education institutions. The ERP systems therefore involves both business and IT managers who work together to define new operational and managerial processes.

The ERP systems are an important element in any institution as it tightly integrates all departments and functions within a single configuration and these systems are responsible for service delivery, management and academic operations to become more professional, more responsive and more customers focused. These systems provide an integrated portfolio of application software designed to decrease cost and assist the process of change.

Educational institutions have implemented ERP systems to manage their resources and maximize the benefits derived from the usage of the ERP systems from the point of view of the organization. The ERP systems encompass various functions and therefore there is a need to understand the very concept of ERP systems functionality and the derived user satisfaction throughout its life cycle. The flexibility of the ERP system also has to be taken into account i.e. the ability of the system to be modified according to the organization’s requirements and needs.

To study the ERP operational requirement, it is very important to determine the flexibility of the ERP systems to support organizational changes. The ERP systems environment which focuses on EPR software suitability, information quality and system quality are the features to be accessed. In educational

sector the survival of EPR systems are on it training of staff and technical staff, user involvement and user characteristics. The maintenance of ERP systems is an ongoing process of integration and transformation of the business needs and there is a requirement to understand its impact on the key organizational activities and processes.

Institutions search for ways of structuring their systems so that the benefits management might expect to gain from the use of ERP systems begins with wide ranging reviews introduced into the universities with the aim of improving the efficiency of the administrative systems while focusing on improved customer services for students. No single measure of enterprise systems success is sufficient for all the concerns an Organization's executives might have about the enterprise system experience, and that different measures are needed at different stages in the systems lifecycle. The focus here is on the system in use, not the system implementation project, and consistent with Markus's view, the researcher does not expect that all ERP systems will produce benefits in each of the dimensions [3].

Another very vital ingredient in the success of any system is the user satisfaction derived from it and the user involvement in this stage is very important but not given its due consideration. There are very limited research studies that endeavor to understand the user involvement–satisfaction relationship; although the ERP systems are more likely to succeed when user involvement is high and they have realistic expectations about the scope of the system and its functionality.

ERP systems are being used in the different organizations to facilitate change. These integrated software products are currently dominating academic and practitioner literatures. The ERP systems facilitate data integration throughout an organization which is also important in higher education institutions as well as to reduce cost and improve customer service and care [8].

Table No1.1: Global Perspective plan for Technical Education 2011-12

Country	Rank	Gross Higher Education Enrolment
Finland	1	94.4%
Sweden	2	71.1%
Switzerland	3	49.4%
Singapore	4	63.6%
Canada	12	62.3%
United States	13	82.9%
China	58	24.5%
India	87	13.5%
Maharashtra	-	18.35%
Angola	142 (Last)	2.8%

According to the report of Directorate of Technical Education (DTE), Maharashtra the International Benchmarking the students admitted and target Intake of students as per DTE perspective plan is shown in following Table No. 1.2

Table No 1.2.: International Benchmarking – Current Status of Maharashtra 2011-12

District	Gross Enrolment Ratio in Higher Education		Technical Education	
	Current (2010-11)	Target (2010-2020)	Students Admitted in firstyear (2011-12)	Target Intake Capacity of first year (2019-2020)
Mumbai	15.15%	35%	20,208	72,967
Mumbai - Suburban				
Thane	6.10%	25%	9,969	52,447
Raigad	60.85%	70%	19,564	26,415
Ratnagiri	17.16%	35%	3,011	9,175
Sindhudurg	7.73%	25%	922	3,823
Nashik	18.22%	35%	18,345	34,289
Dhule	15.44%	35%	4,116	11,930
Nandurbar	8.08%	25%	1,873	7,341
Jalgaon	15.16%	35%	9,459	24,707
Ahmednagar	16.34%	35%	11,640	26,141
Pune	45.98%	60%	62,110	83,301
Satara	21.17%	35%	8,915	16,307
Sangli	21.70%	35%	9,103	15,232
Solapur	15.78%	35%	11,220	25,007
Kolhapur	24.37%	45%	13,744	27,737
Aurangabad	21.05%	35%	11,058	20,092
Jalna	4.15%	15%	1,428	5,428

Source: http://fileserver.mkcl.org/approvedinstitues/OasisModules_Files/Files/69.pdf

1.1 Growth of Educational Institutes

Brahmin gurus imparted education [1] by means of donations and not through charging fees or funds from the students or their guardians. Later, temples were also centers of education in which religious education was compulsory but secular subjects were also taught. Students were required to be brahmacharis or celibates. The knowledge in these orders was often related to the tasks a section of the society had to perform.

The book of laws, the Manusmriti, and the treatise on statecraft the Arthashastra were among the influential works of this era which reflect the outlook and understanding of the world at the time.

A number of urban learning centers became increasingly visible from the period between 500 BCE to 400 CE.The important urban centers of learning were Taxila (in modern day Pakistan) and Nalanda in Bihar, among others. These institutions systematically imparted knowledge and attracted a number of foreign students to study topics such as Vedic and Buddhist literature, logic, grammar, etc.

Figures released by the Indian government in 2011 show that there were 5,816,673 elementary school teachers in India. As of March 2012 there were 2,127,000 secondary school teachers in India. Education has also been made free, for children for 6 to 14 years of age or up to class VIII under the Right of Children to Free and Compulsory Education Act 2009.

There have been several efforts to enhance quality made by the government. The District Education Revitalization Programme (DERP) was launched in 1994 with an aim to universalize primary education in India by reforming and vitalizing the existing primary education system. 85% of the DERP was funded by the central government and the remaining 15 percent was funded by the states. The DERP, which had opened 160000 new schools including 84000 alternative education schools delivering alternative education to approximately 3.5 million children, was also supported by UNICEF and other international programmes. This primary education scheme has also shown a high Gross Enrollment Ratio of 93–95% for the last three years in some states. Significant improvement in staffing and enrollment of girls has also been made as a part

of this scheme. The current scheme for universalization of Education for All is the SarvaShikshaAbhiyan which is one of the largest education initiatives in the world. Enrollment has been enhanced, but the levels of quality remain low.Our university system [11] is, in many parts, in a state of disrepair...In almost half the districts in the country, higher education enrollments are abysmally low, almost two-third of our universities. Development of Education [3] in India has attained new level essentially after the independence of the country. India is a developing nation and it has been expanding is every field. Development of education in India brought about a transformation and the concept of education got modified. Literacy rate has increased from around 3% in 1880 to around 65% in 2001. According to the 2011 Census, the Literacy Rate is recorded to be around 74%. All levels of education in India, from primary to higher education portray a challenge. India got well-known educational institutions such as the IITs, IISc, IIMs, NITs, AIIMS, ISI, JU, BITS, and ISB. The higher education system of India is the third largest in the world, after China and the United States. Development of education in India regards that free and compulsory education should be provided to all children up to the age of 14. Moreover, the 86th Amendment of the Indian constitution makes education a fundamental right for all children aged 6-14 years.

The growth rate of Institutes and students enrolment category is shown in Table No. 1.3 and Table No. 1.4 respectively.

Table No. 1.3: Growth rate of Institutes

Category	2007-08	2011-12	Increase from 2007-08 to 2011-12	Growth Rate of Institutions from 2007-08 to 2011-12 (Percentage)
No. of Degree Awarding Central Institutions	87	152	65	11.8
No. of Colleges in Central Institutions	58	69	11	3.5
Sub total of Central Institutions	145	221	76	8.8
No. of Degree Awarding State Institutions	227	316	89	6.8
No. of Colleges in State Institutions	9000	13024	4024	7.7
No. of State Level Diploma Institutions	1867	3207	1340	11.4
Sub total of State Institutions	11094	16547	5453	8.3
No. of Degree Awarding Private Institutions	73	191	118	21.2
No. of Colleges in Private Institutions	12112	19930	7818	10.5
No. of Private Diploma Institutions	5960	9541	3581	9.9
Sub total of Private Institutions	18145	29662	11517	10.3
Grand Total of All Institutions	29384	46430	17046	9.6

Source: http://www.data.gov.in/dataset/growth-higher-education-institutes-eleventh-plan

Table No. 1.4: Student Enrolment category

Category	Total Enrolment in2006–07(in Lakhs)	Total Enrolment in2011–12 (in Lakhs)	Growth Rate in Enrolment from 2007-08 to 2011-12(in Perc)
Government Institutions	63.38	89.63	7.20
Central Institutions	3.10	5.63	12.70
State Institutions	60.28	84.00	6.90
Private Institutes	75.12	128.23	11.30
Degree Courses	123.54	184.84	8.40
Diploma Courses	14.96	33.02	10.80
Grand Total of Enrolment by Course	138.50	217.86	19.20

Source: http://www.data.gov.in/dataset/growth-higher-education-institutes-eleventh-plan

1.2. Strength of Educational Institutes building nation

Report from UNISCO [16], the to use new information to compare the economic benefits of higher levels of just school attainment with the benefits of higher levels of cognitive skills. We therefore took measures of average educational attainment and average cognitive skill levels for as many countries as possible and examined their relationship to the average annual growth rate in the country's gross domestic product (GDP) per capita from 1960 through 2000.The second half of this century will go down in the history of higher education as the period of its most spectacular expansion: an over sixfold increase in student enrolments worldwide, from 13 million in 1960 to 82 million in 1995. But it is also the period which has seen the gap between industrially developed, the developing countries and in particular the least developed countries with regard to access and resources for higher learning and research, already enormous, becoming even wider. It has also been a period of increased socio-economic stratification and greater difference in educational opportunity within countries, including in some of the most developed and wealthiest nations. Without adequate higher education and research institutions providing a critical mass of skilled and educated people, no country can ensure genuine endogenous and sustainable development and, in particular, developing countries and least developed countries cannot reduce the gap separating them from the industrially developed ones. Sharing

knowledge, international co-operation and new technologies can offer new opportunities to reduce this gap.

Vocalized that education as a medium to build the strength of the nation is was and will always be the area of utmost priority for the Central Government which has from the primary education to the higher education professed and encouraged the development of knowledge and skill base in the country. Hari S Bhartia, Chairman, Board of Governors, stressed on the involvement of entrepreneurial system with the government to overcome the challenges faced by the state. Speaking particularly about management Education he said, "Management education has drastically changed and is driven by factors like demography, globalization and rapid pace of technology [14]. Success involves going beyond the narrow confines of disciplines and addressing issues that need cross functional and sometimes answers beyond the cross functional areas. He also stressed on the capacity building of the youth who have the zeal and energy to lead growth of the country. Technology grabs opportunity in Education Today's Indian Technology companies are converging towards the Education sector, seeing in it a rare promising market created because of liberal Government spending. Yes, it's time where the providers of computing hardware, education-related software and content are eager to tap into business as the state and central government are prepared to set up spending to take education beyond cities and towns to villages. The article published in education oneindia about the technology market researcher IDC has revealed that, about 5% of the $40 billion i.e. 2.4 lakh crore IT market in India, including hardware, software and IT services, was in the education sector. The market is expected to grow at nearly 12% through 2017. The Indian government's education programmes already have some technology component, but that is tiny compared to the overall spending. In 2013-2014, the government allocated more than 27,000 crore to the SarvaShikshaAbhiyan, with a provision to spend 50 lakh in every district on computer-aided learning [25].

The survey was conducted by IT major TCS on nearly 17,500 high school students across 14 Indian cities. The survey found that smart devices and exceptional levels on Online access are making this generation the

mostconnected generation. The insight provided by the survey is as following: 3 out of 4 students said "Research for School" was the MAIN Reason to access the Internet followed by the Social reasons like Chatting/ Connecting with friends. On total, it is 62% of students. Today, accessing e-mail is a growing preference (49% vs 44.54% in 2011-12) at the cost of listening to music (45.47% vs 50.27% in 2011-12). Using Cyber Cafes as an Online access point has dramatically dropped from 46% in 2009 to 14% today. 1 in 5 respondents spend between a nearly 2-3 hours on the Internet daily while 1 in 5 spend between 1-2 hours. Mobiles (18.17%) have emerged as the fastest growing mediums for accessing the Internet among Gen Y, at the expense of home (72.03% vs 84.29% last year), School (14.41% vs 22.08%) and Cyber Cafes (13.57% vs20.54%). 74% of those surveyed said they use Facebook the most to communicate while 54% used SMS - both significantly higher than the number of students who said they used voice calls (44%) for the same purpose. Tablet ownership made an entry this year with 38% owning a device, with 40% metro-based respondents owning one compared with 35% in mini metros. Google Educational App Service Google is all set to travel through education field with its new education apps. Yes, Google is now planning a new kind of Online service called Google Play for Education, for both Students and Teachers. This app will be an extension of the Google Play Store, aimed at schools, which can preserve content in digital format, make a bulk purchase and instant distribution to students android tablets for educational apps, books and videos [24].

1.3 Role of ICT in designing and framing Indian Educational system/policy

Information and communication technologies (ICTs) are a "diverse set of tools and resources used to communicate, create, disseminate, store, and manage information. These technologies include computers, the Internet, broadcasting technologies (radio and television), and telephony. There is increasing interest in how computers and the Internet can improve education at all levels, in both formal and non-formal settings.. Older ICT technologies, such as radio and television, have for over forty years been used for open and distance learning, although print remains the cheapest, most accessible and therefore most dominant delivery mechanism in both developed and developing countries.. In

addition to classroom application and growth of e-learning opportunities for knowledge attainment, educators involved in student affairs programming have recognized the increasing importance of computer usage with data generation for and about students. Motivation and retention counselors, along with faculty and administrators, can impact the potential academic success of students by provision of technology based experiences in the University setting.

ICT [7] is basically an umbrella term that encompasses all communication technologies such as internet, wireless networks, cell phones, satellite communications, digital television etc. that provide access to information. During the past few decades, ICT has provided society with a vast array of new communication capabilities and has fundamentally changed the way we live now. We find a world of difference in the practices and procedures of various fields such as medicine, tourism, banking, business, engineering, etc. as they operate now in comparison to how they operated two decades ago. In contrast, the impact of ICT on education in India, however, has been far less and slow.

The growth of ICTs [10] is taking place all over the world. They have emerged as powerful tools for diffusion of knowledge and information. Their introduction and unprecedented use in the higher education has generated varied response. On the one hand there is acceptance of its potential benefits to knowledge creation i.e. field of research and its dissemination and on the other extreme it is feared that there use will further the digital divide/ inequity. It is inevitable that their increasing use in education system will also raise issues regarding what kind of technologies, in what quantity, at what level and for what purpose they need to be introduced. The concerns such as who will manage this process, develop policy guidelines and strategies also require consideration. It will not be wise to ignore the issues related to equity, cultural integrity, and the negative aspects of technology in economic and social development. Nevertheless, the opportunities and challenges raised at different platforms can be categorized as the aspects relating to role of ICT for access and equity in education, role in management and efficiency in education, their

role in pedagogy for quality learning and teaching at higher education level and in inducing innovations in approaches and programs.

Increasing usage of technology; we are one of the biggest users of ICT (Information and Communication Technology) tools besides the learning management system that we are using today [3]. We have also implemented SAP (System Application & Products) which is an ERP (Enterprise Resource Planning) system which is helping us in integrating academic and administrative systems. We are going to be expanding our operations; we are going to leverage ICT for the purpose of reaching out to a large segment of society which cannot access our learning resources. We are going to come up with lot of diploma and post graduate programmes and we are going to take it to the community through the internet a completely online education system. It will be backed up with video based learning. The Indian policy for developing ICTs as a vehicle for promoting education is visible since the use of satellite in early 1970s. The long road traversed till now has led to launching of dedicated satellite for education. Presently, India ranks 45 in the Network Readiness Index. Although the number of Internet users and penetration of PCs is in fractions online educational enterprise started emerging in early 1990s. In addition the National Task Force on Information Technology and Software Development: IT Action Plan Part III- Long Term National IT Policy (GOI, 1999) constituted by the then Prime Minister of India in 1998 gave fillip to efforts for exploiting rapidly emerging new technologies. Major emphasis of the Policy was on expansion of IT education at school and university level including all national level institutions. Consequently, numbers of programmes were developed and initiated for instance Virtual Campus Initiatives of IGNOU in government sector and NIIT Net-varsity in private sector. Recognizing the existing strong educational infrastructure particularly at higher education level consisting of 18064 colleges/institutions and 378 universities, promotion of use and integration of ICTs in education would immensely benefit the socio-economic development of the country (11th FYP).

Nevertheless, introduction of ICTs in the higher education has profound implications for the whole education process ranging from investment to use

of technologies in dealing with key issues of access, equity, management, efficiency, pedagogy, quality, research and innovation. Therefore, the next section attempts to delineate the role of ICTs in higher education sector.

1.4 Present scenario of Technical and Health Science in India

Today Management education [9] in our country is facing a very significant challenge in terms of employability. Today the institutions are facing the problem of survival, we are seeing large number of institutions closing down, and it's only because of the reason that they have done enough to develop skills which are required by the industry and by the society. The skills are required both in terms of technical and knowledge and its application. However, I certainly see that management education is going to grow in bigger way than what we have seen so far as bigger requirement is going to come up. The requirement will not only be from corporate sector but it is also going to come from the retail, agriculture sector or from the NGO sector. What is important is that the institutions will have to reorient their students from the corporate life.

India has the third largest system of education in the world, next only to USA and China, with more than 500 universities and around 30000 colleges. To introduce ICT-enabled education in such a large system one needs to have high quality multi-media enriched content in different disciplines for various courses including its multilingual conversion, capacity building of teachers and students in ICT skills and state-of-the-art infrastructure along with networking and internet connectivity via Virtual Private Network (VPN) / broadband connectivity for disseminating the content and affordable access devices so that it reaches the doorsteps of the learners. The ongoing National Mission on Education through ICT (NMEICT) is a major initiative of the Govt. of India in this direction with an aim to leverage the potential of ICT in providing high quality personalized and interactive content, free of cost, to all the learners.

ICT, if used creatively, can make a big difference in the way teachers teach and students learn and can help students acquire 21st century skills like digital literacy, innovative thinking, creativity, sound reasoning and effective

communication. ICT can help in enhancing the quality of education through blended learning by supplementing the traditional talk and chalk method of teaching. ICT-enabled education can also be a solution to the growing demands for enrolments in higher education in India and thus help increase the gross enrolment ratio (GER) which at present is very low (about 12%) as compared to the world average of 23%. In case of open and distance education (ODE) system where "Anyone, Anywhere and Anytime", that is, 3A's is the main philosophy, ICT- enabled education can do wonders that no one can imagine and help pave way for the creation of virtual universities in the long run. ICT can also significantly contribute in efficiently managing the governance in the universities and colleges.

1.5 Use of ICT in Education

ICT in Education: need of the Hour article said that Information and Communication Technology [10] is basically an umbrella term that encompasses all communication technologies such as internet, wireless networks, cell phones, satellite communications, digital television etc. that provide access to information. During the past few decades, ICT has provided society with a vast array of new communication capabilities and has fundamentally changed the way we live now. We find a world of difference in the practices and procedures of various fields such as medicine, tourism, banking, business, engineering, etc. as they operate now in comparison to how they operated two decades ago. In contrast, the impact of ICT on education in India, however, has been far less and slow.

According to AICTE[12] information provided about realizing the importance of Information and Communication Technology (ICT) the Ministry of Human Resource Development as per the Mission Document, ICT is the tool in education available to enhance the current enrolment rate in Higher Education, at present 15 percent to 30 percent by the end of the 11th Plan period. The Ministry also launched a web portal named "SAKSHAT" a 'One Stop Education Portal'. The high quality e-content once developed will be uploaded on SAKSHAT in all disciplines and subjects. Several projects are in the completion stage and are expected to change the way teaching and learning is

done in India. The case in point is the project, “Developing suitable pedagogical methods for various classes, intellectual calibres and research in e-learning,” anchored by IIT Kharagpur. Faculties from all the IITs and several NITs are participating in this curriculum development project. The National Mission on Education through Information and Communication Technology (ICT) has been envisaged as a Centrally Sponsored Scheme to leverage the potential of ICT, in providing high quality personalized and interactive knowledge modules over the internet/intranet for all the learners in Higher Education Institutions in any time any where mode. This is expected to be a major intervention in enhancing the Gross Enrolment Ratio (GER) in Higher Education by 5 percentage points during the XI Five Year Plan period and in ensuring access and equity in Higher Education. The Mission has two major components viz., (a) content generation and (b) connectivity along with provision for access devices for institutions and learners. An amount of Rs. 4612 crores is to be incurred during the 11th Five Year Plan for the National Mission on Education through ICT. This Mission is an opportunity as well as a challenge for the bright faculty members of our Universities and Institutions of Excellence to invest their intellectual capital for the knowledge empowerment of all the learners of our Country.

1.6 ERP in Education

Enterprise Resource Planning (ERP) systems have been extensively used by many multinational companies worldwide. Recently, many institutions of higher learning have replaced their legacy systems to ERP systems as a means for integration advantages. The investment in ERP represents the biggest ICT investment for institution of higher learning, they invest millions of dollars and the time taken for the implementation sometimes takes two to three years, or even more. ERP system was introduced to the IHL because of the outstanding demand by different industries especially from the manufacturing industries. Institutions of higher learning in US accept ERP system as a method to obtain high integration for their management system for the betterment of increasingly managing complex operations [9]. ERP for institution of higher learning (IHL) was developed in the direction of support for key administrative and academic services. The module for this ERP system

usually supports academic management which is inclusive of staffs, students, human resource management and finance management. The main advantages of ERP system for IHL are;[25]

- Improve information access for planning and managing the IHL;
- Improve services for the faculty, staffs (Staff self-service environment) and students (Student self-service environment);
- Enable higher availability of administrative systems;
- Increase income and decrease expenses due to improve efficiency;
- Lower business risks;
- Integrated workflow, industry best practices, and reduce dependence on paper; Integration all business functions in IHL environment representing academic, administration, human resource and finance. Previously it is used and supported by separate application systems.

Single integrated database shared by different business function and consequently, different business modules of a single integral information solution is a key importance. Transferring of data can be between individual processes and various users in real time. The usage of the advancement technology of ICT (Web based technology, wireless, cellular and satellite) is an additional advantages for IHL communities. Even though, implementation of ERP systems in the IHL is often described as difficult, risky and expensive, it is also sometimes unsuccessful or ineffective. Chief Information Officer at George Washington University, stated that; “Institutions, which are unlikely to switch to integrated information solutions, will find it difficult to retain their market shere of students. They will sooner or later demand services, offered by other institutions…”[6]

Institution of higher learning is keen to adapt the ERP system, they must fullfil the following criteria;[24]

1) **Integration:** Integration is important to ensure the quality of the service. The integration will not be limited to the inner applications of the institution of higher education, but will be extended to the national and international domain.

2) **Flexibility:** Managing the institution of higher learning (IHL) is too complex, so it is important for the IHL to be able to match the continuous development of their institution. Flexibility responds to changing business requirement, more informed management decision making and changes the way of doing business processes.
3) **Support in decision making:** The ERP system for institution of higher learning must provide the function of governance support processes and shows the data and analysis for the purpose of strategic planning and control.
4) **Service evolution:** The services must cover prospective student, existing student, academic staff, researcher, administration and support staff. These services should be a major priority and it should also be accessed from different locations.

Indian manufacturers and natural resources companies [20] will spend Rs 40,800 crore on IT products and services in 2013, an increase of 9.1% over 2012 revenue of Rs 37,400 crore, according to Gartner, Inc. This forecast includes spending by manufacturers and natural resource companies on internal IT (including personnel), hardware, software, external IT services and telecommunications. TechNavio's analysts forecast the ERP Software market in India to grow at a CAGR of 22.2 percent over the period 2011-2015. One of the key factors contributing to this market growth is the growing demand of ERP in SMBs. The ERP Software market in India has also been witnessing the growing adoption of SaaS-based ERP.

1.7. Research Issues

The selection and implementation of ERP systems is a highly costly and time consuming process. There are numerous Educational institutions around the world that have adopted these systems but have been unsuccessful in fully realizing their benefits. There are many organizations that have even given up their adoption process midway after heavily investing into it due to unforeseen and uncontrolled factors which have resulted in failures.

This research study endeavors to identify the problems associated with selection of an ERP system in HEIs with the aim of obtaining solutions to

these common but imperative challenges. Furthermore, this study also determines means to increase impact and transformation abilities of existing ERP systems in the universities, the benefits to the various users and means to achieve optimal satisfaction from the system usage. In the Education sector the dynamics are rapidly changing and only those ERP systems can operate properly which can consolidate and transform to meet the varying needs of its diverse users. This problem also requires a long-term solution which the research study is investigating within its domain. The various stakeholders identified for the purpose of this research study in HEI context are students, staff (administrators /managers /technical) and academics.

1.8. Research Background and Motivation

Identified issues[22] for Indian large enterprises issues are proved to be crucial in India but not for large enterprises such as proper system implementation strategy, clearly defined scope of implementation procedure, proper project planning and minimal customization of the system selected for implementation, because of some limitations faced by the Institutes / Universities.System is branded as a success or a failure is a judgment [10], usually made at some point in time by one or more people with the benefit of hindsight. Most people, for example, consider that the new system at Heathrow airport's Terminal 5 was a failure when it opened in 2008. Now, however, that same system (more accurately, system of systems) is operating successfully with few reported problems on a day-to-day basis. The judgment of whether a project has 'failed' is not a simple yes/no decision. It is common for systems that initially did not live up to expectations to evolve over time to deliver useful services. However, management usually regard a project tends as a success if it meets three high-level criteria like

1) It should be delivered on time
2) It should be delivered within budget.
3) It should deliver the expected functionality.

Lesson learned from previous other project one should try to reduce the failure rates of ERP systems implementation projects is to build, both failures and successes.In the educational sector's dynamic and rapidly changing environment anyInstitution's competitive edge is determined by its quality of

research and information systems by students and staff both. This research study aims to provide educational institutions with a better understanding of the functional issues, benefits and challenges of ERP systems. This study will provide the HEI with a better understanding of the complexity in ERP selection, post-implementation functionality and usage. The ERP systems are the largest software application packages that are implemented in the universities with a considerable commitment of its various resources. In the opinion very limited research has been conducted in a university setting as compared to other environments [21].

At present, the ERP systems are entrenched in the various activities and processes of the HEI such as research, academic, administration, finance and registration etc and the majority of these institutions use the systems to enhance efficiency and increase effectiveness of routine work. The common challenge to all the HEI is the system's ability to change and modify according to the different requirements and growth of the institutions. The research findings of this study will also contribute to the institutions' future strategic vision.

This research study proposes to provide a theoretical framework for better understanding of the effectiveness of ERP systems in Higher Educational Institutions. The practical outcomes of this research study will be a better understanding of the various users' expectation and perception of the usability of ERP systems. The other outcome will be a better understanding of the impact and future challenges of this dynamic sector.

Statistics it has found that Educational Institutions are spending large amounts of money on implementing ERPs in their systems. However, statistics also say that the success ratio of these implementations is only 30%. There can be three possibilities when it comes to educational ERPs: 1) Either you're at a stage where you are only considering EERP implementation for your institute / Universities. 2)Already chosen one but are not sure of its deployment. 3) And you are encountering problems after deploying it [36].

John Milton once said, "Good, the more communicated, more abundant grows." The quote very well conveys the importance of having an open ended

communication for the want of success. Mostly ERP implementations fail due to the lack of proper communication. While you are in the process of an ERP implementation, make sure that the message is clearly put across. Develop a communication plan, appoint a communication specialist, and monitor the communication done on regular basis. The data revealed that the user's expectations were not met [2] , at least during the first six months after the "go-live" date. There are many factors that are responsible for this. According to the users, they are not duly prepared for all the extra works that had to be done to make the system functions as expected. They are not also informed that it will take some time for the system to become stable and deliver all the promises. Based on the interview, none of the users contested their involvement in selection of the ERP system, yet they felt they might have made wrong assumptions about some key functionality of the system. However, the involvement of the users from the early stage of the project remains the most strategic move that continue to give the users the required sense of belonging and achievement. They are able to take responsibilities and work hard for the success of the project. The findings also show that the users require adequate and more elaborate training. The benefits and impacts provided by EERP systems need a rigorous evaluation. Most existing evaluation studies of EERPs focus on technical issues or implementation processes, these do not provide an explanation about EERPs effects, or if EERPs work well or poorly with a specific user in a particular setting. Thus, evaluating the most critical factors that potentially determine the impacts from these systems is highly desirable in order to explain the actual benefits that could be achieved through these systems by users and organizations since they could affect educational outcomes and delivery [1]. The amount of investment in these ERP systems has been substantial. In the last few years higher education institutions spent more than 5 billions in ERP investment. The aim of ERP implementation in universities is to provide colleges, schools and departments, with an enhanced ability for research and teaching at reasonable or low cost. Unfortunately however, it has been claimed that as many as 60% to 80% percent of all ERP systems fail to meet expected outcomes, while other implementations did not improve performance with users explicitly expressing dissatisfaction with performance [1].

There are a number of publicized failures and success stories but it is possible that there is a dissatisfaction rate of existing EERP systems for reason such as cost, poor quality releases, lacking certain new functionality, etc. The number of EERP alternatives (vendor or open source based is rather small in comparison to the for profit and corporate marketplace so there are not many options and switching EERP systems would be a very expensive proposition (labor plus hardware/software) and one that I would not like to prepare the cost benefit on given the options available today. The previously noted "customization" factor is very real in higher education as is lack of best practice (process) and project management discipline when it comes to major systems installations/projects. All would be contributors to failure or dissatisfaction levels. According to survey of TechRepublic members determined that end-user adoption of an ERP package was the greatest concern among IT professionals as shown in following Table No. 1.5[7]

Table No.1.5: Greatest concerns after an application rollout

Parameters	Concerns after an application in Percentages
Application Maintenance	29
End-user adoption problems	32
Future upgrades	23
Going over budget	15
None of These	1

Analysts confirm that training end users is a significant expense. In a recent report on SAP end-user training, Gartner suggests that, at a minimum, enterprises should allocate 17 percent of the total cost of an ERP project to training. Gartner research also found that companies that budget less than 13 percent of their costs for training are three times more likely to see their ERP projects run over time and over budget when compared with companies that spend 17 percent or more on training. But end users aren't the only staff members who should concern you. Staff turnover among developers is common in organizations that are implementing an ERP solution. If you choose to purchase a packaged ERP solution, be prepared for staff turnover. In many cases, programmers will be excited to learn a new technology, while

others are reluctant to embrace change. On the average, IT managers can expect to lose up to 40 percent of their IT staff, primarily those programmers who are unwilling or unable to master the new software.

Looking at the findings and observations at IBM as a major and long-time participant in the open movement and as one of the world's largest software companies, we expect the future technological environment to be made up of a combination of open and closed source code, all of it adhering to open standards, thereby reducing the costs of integrating and operating the software by client institutions. At present, however, many institutions that have successfully implemented enterprise resource planning (ERP) systems still face the challenges of streamlining their operating procedures, reducing the financial and operational burdens of such systems, and ensuring that such systems can be made flexible enough to adapt to new business needs and technological innovations. We are trying to make our product and service very easily accessible to all the educational institutes. The Rs.10 subscription is a very affordable price, and I am sure educational institutes will take advantage of this. Like our product which is based on cloud model, the commercials also follow the same principle. The Cost is often the first factor institutions consider, because the price tag can be high. Remember to add the cost of any required customizations to the standard package by completing the process mapping and enhancements step. Other typical costs include ancillary systems, maintenance, training, licensing, and technical support[5].The IT department should identify the criteria for making the final buy versus build decision. Some common factors include performance, functionality, cost, impact on institution functions, state mandates for reporting, etc.

Think about the cost that will be involved when you purchase an EERP. In short the following cost will be involved:

Table No. 1.6: Cost of traditional EERP system

One time cost to run any EERP	Run and maintenance cost
1. Cost of the EERP – Rs. 5,00,000 to Rs. 15,00,000 2. Server and Backup server to run the EERP – 2 servers Rs. 2,00,000 to Rs. 4,00,000 3. UPS with 24 hour backup – Rs. 1,00,000 to Rs. 2,00,000 4. Firewall for the security - Rs. 2,50,000 to Rs. 4,00,000 5. Antivirus, OS and other software's - Rs. 50,000 to Rs. 1,00,000 6. Bio metric devices – Rs. 15,000/Device to Rs 25,000/Device.	1. EERP AMC – 20 % to 30% of total cost of EERP 2. Hardware EERP – 10% to 20 % total cost of Hardware 3. 100 SMS per student (even if there is 1500 students) – Rs 1, 00,000 to Rs 1,50,000. 4. Employee to maintain the security and hardware's – Rs 20,000 to Rs 30,000 per employee per month.

Thus to implement a ERP it will cost the school/institute approximately Rs 12,00,000 to Rs 25,00,000 and to maintain the ERP it will cost around Rs 5,00,000 to Rs 8,00,000 per year. Still after so much cost the school authority will not get the performance and security level of Google or Rack space and also a service in a monthly basis.

The cloud computing S-a-a-S model is a recursive investment which will be always be much less than your monthly cost to maintain any ERP and the best part is there is no one time big investment involved.

Minimizing cost [25] of the hardware is now the responsibility of the cloud service provider. There is no requirement of any hardware at the campus, whatsoever. Even the cost of software decreases. You don't need to buy the fix time licenses or user based licenses. Now you only need to pay based on the usage of a particular service. The web, social software and cloud computing are having a great impact on enterprise IT – but according to distinguished analyst with Gartner, the impact of web, social software and cloud computing on our educational system will be astounding. Cloud computing is a new delivery method and choice available for Higher Education Enterprise Systems. It is a massively scalable, offsite infrastructure accessible on demand across the internet on a pay-per-use basis eliminating upfront investment costs [39].

1.9 Research Objectives

The main objective of the competed research is for ensuring successful EERP implementation, by confirming the effect of Educational ERP system on cost saving and its effect on administration in general. To do so, the research analyses various Critical Success Factors and implementation of EERP. To achieve the goal of the study, the following research questionnaires of Management, Faculty and students are addressed as primary research objectives: Three set of questionnaire are attached in the **Annexure 1**.

This research attempts to provide answers to the objectives by following research methodology

1. Propose questionnaire to be filled by stakeholder to judge the effect of EERP
    - Conduct a survey based on the proposed questionnaire
    - Identify functions in various Institutes positively impacted by EERP systems
    - Identify overall user opinion about success of EERP system
    - Present success indicators from which EERP success can be determined
2. Collect secondary data from the various resources available regarding EERP implementation experiences and the various articles, case studies available through books, journals, internet etc.
3. Validate the effects observed by extensive analysis of collected data of organizations
    - Identify the various areas of cost saving
    - Analyze the effect of EERP implementation on various costs
4. Highlight the areas showing healthy improvement and identifying area where EERP is not able makes significant effect
    - Provide research findings based on empirical analysis of EERP success – Suggest recommendations for fine tuning of the EERP systems implementation in least affected areas.

5. Suggesting framework of Educational ERP system which will minimize the cost, maintenance and provide better security and performance of the system

1.10.Importance of Research

It is widely accepted from empirical evidence to date that the benefits from EERP systems are very significant [15]. These benefits mostly come from the integration of all the necessary business functions across the organization, with which the organization can make its business processes more efficient and effective. However, the complex nature of EERP systems has required many organizations to commit significant organizational and financial recourses to their EERP initiatives, which in turn have encountered unexpected challenges associated with system implementation. For this reason, EERP implementation is generally considered a high cost and high risk activity that consumes a significant portion of a company's capital budget and is filled with a high level of risk and uncertainty. There have been many failure cases reported in the literature, which shows mostly abandoned implementation project with significant financial damage. Many companies have suffered from partial failures which resulted in tenuous adjustment processes for their business functions and created some disruption in their regular operations[10]. To overcome these problems, more extensive studies with respect to the factors affecting EERP success or failure are required to minimize EERP implementation risks. If the development of an enterprise system is not carefully controlled by management, management may soon find itself under control of the system [6].

The vast literature related to EERP systems in research has focused on the success or failure of EERP implementation. The identification of these factors has been mostly based on the experiences of IT professionals or senior managers, Management, Faculties students and administration in the Institutes / Universities. However, it may happen that end users do no care to use the EERP system in spite of the successful EERP implementation. In this case, the implementation cannot be regarded as successful. For these reasons, this study focuses on analyzing the EERP success from the combined point of view of

amount of cost saving and user perception of benefits achieved. Based on this concept, evaluation factors will be postulated with the redefined EERP success, and then will be validated empirically through data analysis.

The results of this research can provide helpful information to the Institutes / Universities and EERP implementers where exactly the Enterprise Systems is delivering benefits and what are the weak areas? Clearly, it is critical to identify and understand the savings and benefit areas that largely the areas and analyze them according to their significance. If these weak areas are addressed properly, the EERP systems will be able to contribute to the Institutes / Universities profitability in a big way to support for Quality education. This is one of the key issues related to Enterprise Systems in the business domain, and can improve EERP systems and implementation in general.

1.11. Research Justification

The continuous technological advancement and the increasing complexity of the ERP systems require the universities to regularly upgrade their systems. The ERP systems, the interfaces, administrative, educational and support systems have a limited lifespan. These systems require upgrading and modifying according to diverse and changing needs as it is essential to maximize an institution's effectiveuse of these systems. It is very important to retain support from the software vendors for proper maintenance and modification of the ERP systems. These systems are the largest software applications adopted by universities through significant investments made in their implementation [1].

There is a lack of research that focuses on key factors of ERP systems from the viewpoint of its multiple stakeholders in an educational context. This research studies aspires to address these gaps. The Higher Education Institutions need to have a necessary knowledge base and guideline to enable them to carefully handle the post implementation phase and manage institutional impacts on the various stakeholders. This research study aims to develop a theoretical framework which will assist the Higher Education Institutions' in their management of the ERP systems, the impact of ERP systems on end users, benefits realization and the challenges being faced in maintaining these systems[16].

1.12. Organization of the Research

This research consists of 6 Chapters.

Chapter 1 introduces background information and motivation for the research in the area of EERP system.

Chapter 2 discusses the evolution and introduction to EERP system and review of Indian EERP market. It presents an overview of Enterprise Systems and application modules for Institutes / Universities by providing the general concept of such EERP systems.

Chapter 3 in this section, previous research on ERP and EERP systems and reviews the evaluation of EERP systems done by previous research so far. Review of what exactly happen when the institutes / Universities started using EERP systems will be judged through a extensive review of literature.

Chapter 4 presents the research design, showing survey instruments and their descriptions.

Chapter 5 contains the analysis of the survey results and analysis and interpretation

Chapter 6 contains research findings, suggestion, design and summarizes the study which concludes by examining the contributions of the completed research and presents recommendations for future continuation of this work.

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CHAPTER 2

HISTORICAL BACKGROUND OF EDUCATIONAL INSTITUTES AND ERP

2.0 Introduction

In recent years higher education has been strongly influenced by global trends, especially as a result of the call by governments for universities worldwide to improve their performance and efficiency. Rising stakeholders' expectations (particularly students and governments), quality and performance requirements, and competitive education environments, along with decreasing governmental support, have pressured universities worldwide to adopt new strategies in order to improve their performance. Consequently, the higher education sector has turned to Educational Enterprise Resource Planning (ERP) systems in the hope of helping them to cope with the changing environment. As a result, existing management and administration computer systems have been replaced by ERP in these institutions, to achieve more efficiency and accessibility for all members and improve end users performance by providing better managerial tools.

In light of these facts and due to the significant investments of resources made by organizations to adopt or shift to ERP system, researchers have a strong desire to explain the causes and the factors that lead to good performance with ERPs, what factors influence implementation success and failure and the reasons behind the problems that occur with the implementation of ERP systems.

Educational ERP for Institutes / Universities which is a multi-campus educational institution can expand student services, improve financial performance, enhance operational visibility, support strategic decision making, and reduce costs.

- Reducing university administrative costs through efficient management – Educational ERP solutions support all processes from front office to back office – including those involving prospects, students, and alumni, as well as financials, operations, procurement, human capital management, reporting, and analytics. Support for integrated workflow results in fast,

organized, and productive management processes across the campus and research community.

- Students, faculty and staff with information and processes – Many higher education and research organizations spend the bulk of their IT budgets on maintaining existing infrastructure and integrating heterogeneous systems, leaving few resources for innovation. Educational ERP system platform integrates your students, faculty, and staff with information and business processes while reducing complexity and cost.
- Meeting compliance and governance requirements – Educational ERP allows you to meet demands for accountability and financial transparency with executive dashboards, alerting and reporting, security and identity management, content and records management, and workflow and business-process management. Deploying a common platform helps you meet risk mitigation objectives and comply with directives.
- Promoting a relationship-focused mind-set with constituents – Educational ERP solutions help you improve the efficiency of communications with various stakeholders and foster a focus on your constituents, such as students, faculty, alumni, and suppliers. In today's competitive academic environment, organizations must differentiate themselves by providing personalized, timely and easily accessed information.

The result is better management of campus activities, student life cycle, research, grants, financials, operations, human capital, procurement, and assets.

2.1. Organizational Processes of Educational ERP system:

Educational ERP's solution portfolio for Institutes / Universities supports the full range of organizational processes namely –

- Human resources and Payroll
- Administration
- Hostel, Campus & Library Management
- Examination, Results and Consultancy
- Knowledge Management and e-learning
- Training and Placements

- Departmental Integration
- Student life-cycle management
- Grants and funds management
- Financial management, budgeting, and planning
- Relationship management, institutional development, and enrollment management
- Governance and compliance
- Procurement
- Enterprise asset management
- Business services
- Performance management

With Educational ERP the following key processes are for managing the student life cycle –

- Academic structure and class scheduling
- Define and categorize programs of study and course offerings.
- Manage rules that apply to admission, registration, enrollment, and examination.
- Oversee requirements that must be completed by a student to achieve a degree.
- Student information management: maintains central student records that capture students' personal and academic data throughout the student life cycle.
- Provide online services and guided procedures to support a consolidated, end-to-end process to manage the full student life cycle.
- Manage student accounting, tuition calculation, and bursar functions.
- Recruitment and admissions: manage recruitment campaigns targeted to specific prospect groups.
- Process admission applications on time and in line with institutional rules.
- Support potential applicants in their decision making through transparent and online information regarding transfer rules and transfer articulations.
- Grading and advising Help advisors plan for successful program completion with their students.

- Give faculty central access to the students they need to appraise.
- Detail each student's progress toward meeting defined academic requirements.

In addition, Educational ERP provides capabilities for enterprise management and support, enabling you to-

- Manage substantial amounts of funds
- Recruit and retain highly qualified personal
- Administer complex work contracts of employees
- Manage critical and expensive assets
- Effectively handle procurement processes
- Comply with environment, health, and safety regulations
- Manage material stocks
- Manage funds from sponsors, donors, and endowments
- Comply with governmental regulations
- Manage corporate performance
- Provide analytical insight into data

ERP systems are inherently complex systems spanning many functional areas and processes along a firm's value chain. They are designed to provide flexible solutions to business problems. The sheer number of possibilities available for figuring an ERP system implies many potential security configurations. However, ERP systems pay little attention to potential conflicts and problems in those security configurations. Deployment and implementation of ERP systems also pay little attention to security implications, as the main purpose is to solve business problems within time and budget. In post implementation stages, auditors have access to rudimentary ERP tools and capabilities for auditing security configurations. There are also shortages of staff member strained in the ERP security.

2.2. ERP Historical Account

The Enterprise resource planning systems are a more specialized form of the material requirement planning (MRP) that originally derived from the manufacturing resource planning systems and this is also collaborated by [1].

The term ERP system was coined by the Gartner Research Group in 1992. These systems are highly integrated software packages that could be modified to cater to the specific needs of any organization.

The roots of ERP systems can be traced back to the Material Requirements Planning systems (MRP) in the 70's. These systems evolved to the Manufacturing Resource Planning systems (MRPII). Shankar narayanan in 1999 identifies four phases in the ERP systems history:

Table No. 2.1: Evolution of ERP

Timeline	System	Platform
1960s	Inventory Management & Control	Mainframe legacy systems using third generation software-(Cobol, Fortran)
1970s	Materials Requirements Planning (MRP)	Mainframe legacy systems using third generation software-(Cobol, Fortran)
1980s	Materials Requirements Planning (MRP-II)	Mainframe legacy systems using fourth generation database software and manufacturing applications.
1990s	Enterprise Resource Planning	Mainframe client-server systems using fourth generation database software and package software
2000s	Extended ERP or ERPII	Client-server systems using Web platform, open source with integration to fifth generation applications like SCM, CRM, SFA.

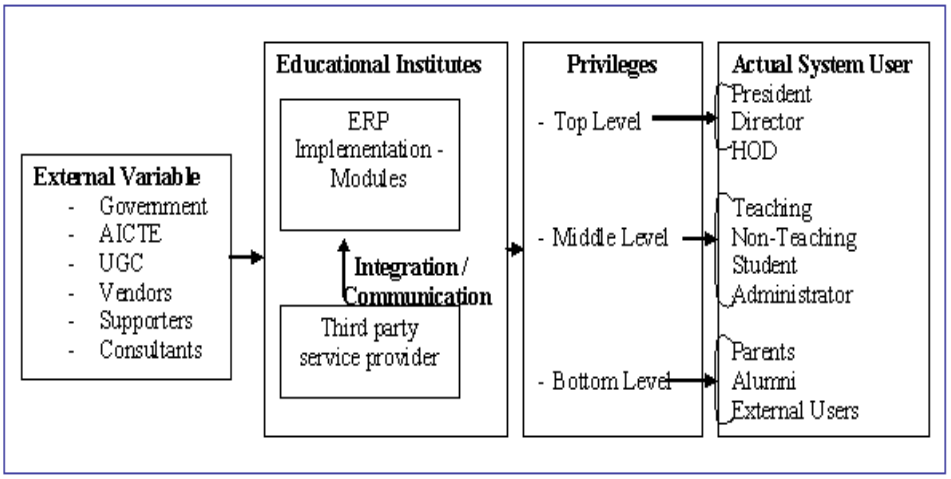
Source from: Evolution of ERP (Enterprise systems for Management, Luvai and Leff, 2012)

Table No. 2.2: Changing Presumptions of ERP from 1955 till 21st century

1955	2005	Future
More Infrastructure	More Effective Infrastructure	Intelligent Infrastructure
Cope with Shocks	Plan for Shocks	Prepared for Shocks
Demand Led Investment	Invest for efficiency	Externalities in Rational Basis
Public own Infrastructure	Hybrid Public & Private Owned	"Cooperative" Public & Private Owned
Space Age	Information Age	Intelligent Age

2.3. Environment of Educational ERP system

Fig No. 2.1: Environment of Educational ERP system



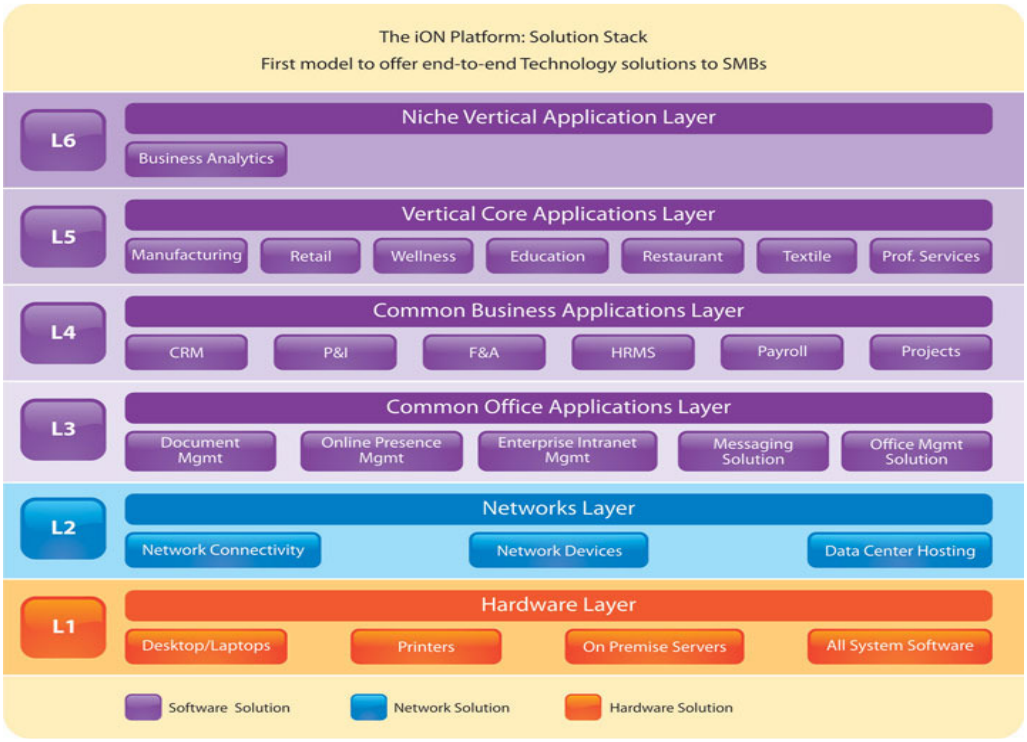
1. **Government** : Rules and Regulations.
2. **AICTE & UGC** : Norms and MIS Reports.
3. **Vendors** **:**Implementation of Educational ERP (Customized , Standardize, Business Process Reengineering)
4. **Supporters** **:** Sharing Knowledge, User Involvements, giving Training, providing online help and upgrade Business Process information to development team / Consultants.
5. **Consultants** **:** Consultants domain knowledge, Experience of executing Educational ERP, Project management, Time Management, Technical competence and Business Process Reengineering
6. **Third Party** : Integration / communication / plug-ins with Educational ERP
7. **service Provider** Systems implemented in Educational Institutes

2.4. ERP Systems

An Education ERP system is developed after an in-depth analysis of the requirements of the educational institution and in close coordination with the various stakeholders specifically educationists, chartered accountants and the quality management personals that help run all the institutions in a productive and efficient manner. The main aim of an Education ERP is to provide mechanisms for automated processing and management of the entire

Institution. Another factor to consider are limited resources in academic institutions and any decisions made carry long term consequences and the requirement is for accurate information on which to base these decisions. The Education ERP is designed based on a modular approach that enables flexibility to choose desired modules as required. The strengths of the system are that it reduces data error and ensures that information is current and managed efficiently [4].

Fig No. 2.2: The iON platform for ERP system



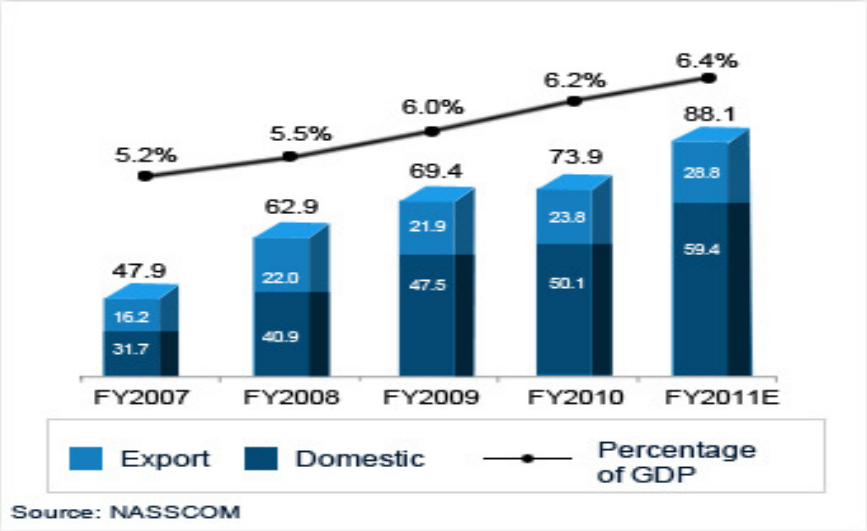
The above figure No. 2.2 provide layer wise solution stack which can help developers to understand the importance of each layer and occurrence of problem in each layer.

2.5. Growth and current scenario of IT : India and Global

The article published in education oneindia about the technology market researcher IDC has revealed that, about 5% of the $40 billion i.e. 2.4 lakh crore IT market in India, including hardware, software and IT services, was in the education sector. The market is expected to grow at nearly 12% through 2017. The Indian government's education programmes already have some technology component, but that is tiny compared to the overall spending. In

2013-2014, the government allocated more than 27,000 crore to the Sarva Shiksha Abhiyan, with a provision to spend 50 lakh in every district on computer-aided learning. According to the message given in annual report 2010-11 by Harsh Manglik, Chairman, NASSCOM stated that 2010 started with the backdrop of the global economic crisis and an uncertain environment. However as the year progressed, we witnessed a resurgence in technology spending led by pent up demand and return of discretionary spending. The fiscal year 2010-11 reflected a strong rebound in growth for the Indian IT-BPO industry which is estimated to aggregate revenues of USD 76 billion this year, a growth of over 19 percent from the previous year. Most of our members – large, medium and small have reported high growth rates and many above our estimates. The domestic market has also reflected a similar growth path and increasingly new partnerships are being created across corporate India and the government.

According to research summary: India - Comparison of Locations by neoIT (2004), Information Technology industry in India has gained a brand identity as a knowledge economy due to its IT and ITES sector. The IT–ITES industry has two major components: IT Services and business process outsourcing (BPO).



According to the report from NASSCOM on Indian IT-BPO Industry the growth in the service sector in India has been led by the IT–ITES sector, contributing substantially to increase in GDP, employment, and exports. The

sector has increased its contribution to India's GDP from 6.1% in 2009-10 to 6.4% in 2010-11. According to NASSCOM, the IT–BPO sector in India aggregated revenues of US$88.1 billion in FY2011. The top seven cities that account for about 90% of this sectors exports are Bangalore, Chennai, Hyderabad, Mumbai, Pune, Delhi, Kolkata, Coimbatore and Kochi Export dominate the IT–ITES industry, and constitute about 77% of the total industry revenue. Though the IT–ITES sector is export driven, the domestic market is also significant with a robust revenue growth.

This sector has also led to employment generation. Direct employment in the IT services and BPO/ITES segment was 2.3 million in 2009-10 and is estimated to reach nearly 2.5 million by the end of financial year 2010-11. Indirect employment of over 8.3 million job opportunities is also expected to be generated due to the growth of this sector in 2010-11. However, the sector continues to face challenges of competitiveness in the globalized world, particularly from countries like China and Philippines.

India's growing stature in the Information Age enabled it to form close ties with both the United States of America and the European Union. However, the recent global financial crises has deeply impacted the Indian IT companies as well as global companies. As a result hiring has dropped sharply, and employees are looking at different sectors like the financial service, telecommunications, and manufacturing industries, which have been growing phenomenally over the last few years.

The global information technology report 2012, “World Economic Forum Geneva”, The convergence of information technology (IT) and communications technology (CT) will be an important part of these technological innovations. All countries have come to realize that an integrated ICT industry will enhance the competitiveness and creativity of their economies and fuel the sustainable growth of the global economy. Countries everywhere—from Europe, Africa, and Asia to the United States and China—have been unveiling their innovative strategies for the ICT industry. These strategies are intended to make the industry an “enabler” of future economic growth. Converged ICT technologies will bring dramatic changes to our lives. Research has shown that the ICT industry contributes 25

percent of the European Union's growth in GDP and 40 percent of its productivity growth. Within the ICT domain, considering the value of cloud computing alone, the aggregate sum is forecasted to exceed US$1 trillion in Europe by 2020. We have every reason to be excited and confident about the future of the ICT industry.

2.6. Representative Features & Key Benefits of Modules

The type of benefits arising from ERP systems use can be classified as operational, strategic, managerial, organizational and IT infrastructure benefit at different times during the ERP experience. The proposed ERP benefits framework is as follows:

- **Operational:** Cost reduction, stakeholders service improvement, cycle time reeducation, productivity improvement and quality improvement.
- **Strategic:** Build business innovations, build cost leadership, build external linkages (Students and Industry), generate customization, support business alliance and support organizational growth.
- **Managerial:** Better resource management, improved decision making and planning and performance improvement.
- **Organizational:** build common visions, empowerment and facilitate business learning.
- **IT infrastructure:** build business flexibility for current and future changes, increased IT infrastructure capability and IT cost reduction.

EERP system modules should cover all area of education management. The modules and their indicative features of the same have been briefly described in the table below.

Table No. 2.3:Features & Key Benefits of Modules

Sr. No.	Modules	Key Benefits
1	**Information**	
1.1	Student Information System	Students details like profile, academic fees, placement, attendance , Identity Card etc.
1.2	Staff Information System	Staff details (profile, research papers, contact point, e-mail etc)
1.3	Infrastructure Management	Facility mapping, infrastructure in different facilities.
2	**Administrative**	
2.1	Admin	Giving privileges to user and validating authenticated data / information and display. Any type of addition and subtractions can be made by admin.
2.2	Entrance Management	Downloadable forms, on-line application, data collation etc /Student selection process management (test schedule, collation, results, access etc)
2.3	Fee Management	Fee structure, fee acceptance transaction, fee receipt status etc.
2.4	F & A/C Management	Take care of Financial & Accounting transactions. Also provides facility to attach voucher/documents for future reference / auditing over web.
2.5	Payroll Management	Leave request & approval, Salary calculation, generate salary & statutory reports.
2.6	Inventory Management & Procurement	Inventory, Indenting, purchase order, receipts and payments etc.
2.7	Hostel Management	Room allotment, hostel clearance, Administrative expenses etc
2.8	Transportation Management	Route Charts, Vehicle Maintenance and Expense Reports, Driver's Profile, Allocation of Students to Buses etc.
2.9	Visitor Security/Gate Pass System	Gate Pass creation system allows you to print a Gate Pass for the visitor. You can create a gate pass either from a prior appointment or you can also create a new gate pass.
2.10	File Tracking System	Automated Physical / Digitized file tracking system.
2.11	Document Management	Manages the Inward and Outward Communication of administration section. Updates reply status, Maintains postal expenses.
2.12	Human Resource Management	Manage personal information of Teaching and Non-teaching staff, qualification details,

Sr. No.	Modules	Key Benefits
		Experience details, joining date details, promotion dates, university approvals, service record, applicable pay scale, staff pay details, leave status, etc.
2.13	Customer Relationship Model	Interactive Voice Response System, Call Center Facility, SMS Gateway, Messaging System, E-mail, Timely Notices, Reminders and Alerts.
3	**Academic**	
3.1	Course Management/Attendance	Course design, syllabus, time tabling, substitution, attendance, lesson plan, course monitoring, course feedback & evaluation etc
3.2	Examination Management	Exam time table, grading, consolidated report cards etc.
3.3	Knowledge Management	Individual or group Sharing of new ideas, uploading the file to read for others.
3.4	Research Information	Research Journal paper acceptance / rejection, project grant, utilization of resources, Allocation of resource persons, Committee formation
3.5	Continuous Evaluation	Evaluation criteria like number of class test, small group activities etc.., grading system and consolidated marks/ grade.
3.6	Quiz	Upload Objective / descriptive type question, level of difficult question, set of question paper with different level of questions and result.
3.7	Library System	Complete Library Automation System with Bar code reader.
3.8	Feedback System	Feedback criteria setting and guiding Management , faculty and students for improvement.
3.9	Scholarship	Maintains enrollment of students in various scholarship schemes. Check scheme sanctions, Undertakes disbursement, generates utilization certificate, track scholarship fund flow etc.
4	**Interactive**	
4.1	Notice Board	Single point, fast and paperless dissemination of information..
4.2	Discussion Forum	To come-up with solutions to the problem with help of chat, forums and social networking sites.
4.3	Events & Scheduling	Fast and instant communication among peers, alumni etc.
4.4	Management Reports	Top management MIS reports focusing on key result areas.
4.5	Alumni Information	Comprehensive alumni information Placement Company data base, company interaction management, interface for companies for direct access of relevant data.

Sr. No.	Modules	Key Benefits
4.6	Placement Information	Information of company requirement, criteria, results and upcoming events
4.7	Communication Media	Communicating stakeholder's of Educational Institutions via e-Mail, SMS or Alerts.
4.8	Student /Faculty/Guardian Dash Board	Create dashboard for each stakeholder which can access and view relevant information by customized accordingly.
4.9	Utilities	Software and related patches should be uploaded for utilization.
4.10	Log Information	Keeping track of Un-authorized changes made by Stakeholder's and maintaining log.

2.7. Different ways of Implementing EERP

Educational ERP system developed under different environment which can be suitable for Institutes which are going to implement and ensure the desired availability of IT resources to end-users whilst ensuring maximum cost reduction. To understand some of the possible architectures this comes under one of the following are:

2.7.1. SINGLE LOCATION

This is the solution when you are planning to install EERP in a single office only with single User connected to same machine or all the Users connected to the server using the LAN.

- **Standalone**
  - Single server configured as Application and Database with backup devices
  - User access the ERP on same machine.
- **LAN**
  - Single server configured as Application and Database with backup devices
  - Users access the ERP using the Browser over the LAN.

2.7.2. MULTIPLE LOCATIONS

- **Software only at Central Server with central server at ISP**

Here you can run the entire process through a single Application server and single database server **located centrally at the ISP premises,** irrespective of

the geographical location and number of Users at HO/Different Campuses/Students etc. Different locations access the software at the central location. No copy of software is installed at individual locations. **Here for all locations, it is necessary to be connected to the internet while doing transactions.**

- **Software only at Central Server with central server at Head Office (HO)**

Here you can run the entire business through a single Application server and single database server located centrally at its HO premises, irrespective of the geographical location and number of Users at HO/Different Campuses/Students etc. Different locations access the software at the central location. No copy of software is installed at individual locations. Here for all locations except HO, it is necessary to be connected to the internet while doing transactions.

- **Software also at other locations with Data replication on central server using Internet**

Here each location will have Software and database installed on their local server. Each location will operate independently of other locations. At the end of the day, these locations will replicate the data on the central server using the internet/direct-dial-up by replication technology. Here it is not necessary to be connected while doing transactions. So this model permits offline data entry.

2.8. Software and Data on central using Cloud Computing

Here each software and hardware are on cloud computing and therefore it is fully scalable. Even though there is increase in users or Institutes using cloud computing it is scalable and can increase storage, there is no need to plan for a new server. The allocated space expands automatically and the charges are only for utilized capacity. No maintenance cost and up gradation cost as demand needs change the business process or change in the flow and to connect to the internet while doing transactions.

There are three types of models on which EERP can be implemented on cloud, the deference between those models are as shown in Table No. 2.4.

Table No. 2.4: Main Differences between Public, Private and Hybrid models of cloud

Model / Feature	Public	Private	Hybrid
Owned and managed	Service provider	University	Service provider and University
Access	By subscription	Limited to students, faculty, staff of the university	By subscription and Limited to University stakeholders
Customization and control	None	Yes	Partially customization and control

2.8.1. Cloud based activities provided by different vendors to Universities / Institutions

Universities implementing various cloud solutions provided by different vendors along with cloud services and type used by them are as shown in fig. 2.3 which will give Universities / Institutions to know about the activities [5].

Fig No. 2.3: Cloud Solutions for Universities

Cloud service	Cloud model	Activities / Solutions	Business Intelligence	Student Lifecycle	E-learning	Admission	Accounting -financial	Human resouces	Aquisition	Case management	Building administration	Digital library
SaaS	Public	Microsoft Live@edu			✓							
SaaS	Public	Microsoft Office Live Workspace			✓					✓		
SaaS PaaS	Private Hybrid	Microsoft Dynamics CRM Online		✓		✓		✓		✓		
SaaS IaaS	Private	CampusEAI Private Cloud		✓	✓	✓						
SaaS IaaS	Private Hybrid	Jaspersoft and RightScale	✓									
SaaS	Public	Google Docs			✓					✓		
SaaS IaaS	Private Community	educationERP .net		✓		✓		✓				✓
SaaS	Private Community	Campus management	✓	✓	✓	✓	✓	✓		✓	✓	
SaaS	Private	Coupa e-Procurement							✓			

NOTE: In all the options in Multiple Location, instead of Internet, dedicated Point to Point lines / Private Network / VSAT links can also be used. Any form of connectivity will work.

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CHAPTER 3
LITERATURE REVIEW

3.0. Introduction

An extensive literature review will be done on the concepts and theories related to Impact of **Educational Enterprise Resource Planning** (EERP) in Colleges / Institutes / Universities. A review of Research papers, articles is undertaken to take note of and acknowledge work that has been done in the field of EERP implemented in Colleges / Institutes / Universities. The Researcher has collected secondary data from reputed Journals and Magazines, Newspapers, articles, Internet websites and Archives. The Researcher has visited Libraries in and around of Pune City, to collect secondary data.

The researcher has identified 40 research papers along with 3 articles published in International Conference on related topics such as implementing Business Intelligence (BI) in EERP and renowned journals and news papers of various topics such as implementation of Educational ERP, benefits and Critical Success Factors (CSF), Business Processes, micro-level decision support systems, complexity, demand etc.

The researcher has identified the factors influencing implementation and post-implementation of EERP in Educational Institutes / Universities. The following are the factors:

3.1. Concepts of Existing Educational ERP system.
3.2. Identification of problems
3.3. Effective Decision Making
3.4. Infrastructure Facilities in Institutes / Universities.
3.5. Critical Success Factors (CSFs) influencing for implementing Educational ERP system.
3.6. Cost of implementing Educational ERP, Hardware and services after sales.
3.7. Customization of Educational ERP Packages.
3.8. Security Systems for hardware and Software.

3.9. Impact of training on Educational ERP stakeholders.

3.10. Pre and post requisites of implementing Educational ERP system.

Literature review for previous research studies, related to the present research study is as follows:

3.1. Concepts of Existing Educational ERP system

W. Stewart., W. Duggan has published their paper onA Knowledge Contribution Model to a Knowledge Management System[37]**-** In this research paper author has derived Motivational forces from two sources (1) employees' personal belief structure, and (2) institutional structures values, norms and accepted practices that shape an individual's belief structure. Sharing knowledge takes time and effort and doing so at work results in the public good dilemma, others will have access to the accumulated knowledge of the organization whether or they were not contributed to this knowledge pool. By sharing knowledge an employee could perceive that to loose their uniqueness to the organization, and this comes at the cost of time, effort, and uniqueness that the employee might not be willing to incur for 'good' reason. This article focuses on sharing knowledge and contributing to knowledge pool. The author has studied the importance of sharing of knowledge in the organization and its merits and demerits. This will help the researcher for how knowledge management can be implemented in EERP for higher educators.

J. deSousahas published thesis on definition and analysis of critical success factors for erp implementation projects[11] **-** This thesis gives insight about ERP System overview, their expectations and motivations. Recently, some researchers have focused on knowledge management concerns and they have applied some theories in the ERP context. Few issues have been addressed in terms of business modeling and how this area can be improved. The review shows that development of ERP products has been centered in technological issues.

This thesis focus on how some types of organizations have adopted ERP systems and the requirements, risks and benefits associated. EERP complexity, integration and flexibility should be addressed in the future. Technologically, other areas where researchers can help are the development of interfaces,

componentization and integration of technologies. There is also the need to study how organizations, once they decide to adopt an ERP system, evaluate the impact of the new adoption decision on the business and organizational processes, and in some cases on the organization strategy. There is also the need to study the role of each party (vendor, customer and consultant) and their influence in ERP selection. An important issue is the definition of those decisions the organizations face prior to implementing the ERP solution.

The researcher should focus on EERP selection methods and criteria affecting the ERP selection, specially the EERP selection process for Organizations and its particularities. One of the studies analyzed the differences in characteristics of the ERP system selection process between organization and large universities. EERP system needs to evaluate the impact of the adoption of the system and focus on the factors influencing in selection of the system. The strategies and goals of the organization should be adopted while developing the system by the vendors.

M. Stevenson, has published paper on Embedding Hands-On Experience with ERP Systems into University Courses: Aligning Academic and Industry Needs[19] - This article specifies about ERP systems are widely used in industry but there is a misalignment between the way in which ERP concepts are traditionally taught in UK Universities and the expectations of employers in practice. This paper provides a brief overview of a new and innovative course which gives students hands-on experience with ERP systems. The course has received positive feedback from students and has implications for the way in which ERP concepts are taught and understood in Universities and the 'readiness' of graduates for industry. It is anticipated that, in the long-term, this will provide significant business benefits while hands-on experience with ERP systems can also help students grasp the theory underpinning the tools; hence, the material provides benefits from both an academic and a practitioner perspective. A number of challenges have been overcome in order to incorporate the material within existing degree structures. Some challenges remain outstanding; for example, ERP systems provide integration which blurs the boundaries between marketing, procurement, production, accounting and so on. To teach these integrated concepts more effectively, similar integration

is required within Higher Education institutions. In addition, the author is currently considering the prospects for incorporating access to this ERP system within his wider research activities.

It is anticipated that the number of courses offering hands-on experience with ERP systems within UK Universities, in several disciplines, will grow over the next few years and be warmly welcomed by a wide range of students. Future research can conduct follow-up studies which build on the initial insights provided in this paper once more students have been given hands-on experience with ERP systems and progressed into industry.

The article focuses on Maintaining Academic Integrity and Encouraging Critical Refection like impact of ERP systems from the stakeholder's perspective, applicability of ERP system, Management value of ERP system, learning theory about ERP system, understanding business processes and hands on experience of handing the ERP system.

E. Bernroider., J. Mitlohner has published their article on Characteristics of the Multiple Attribute Decision Making Methodology in Enterprise Resource Planning Software Decisions[4]**-** This article firstly supplied an overview of ERP diffusion considering the stages of the system's lifecycle.

1. The first empirical perception was that the majority of companies (65%) were following a value-focused approach characterized by considering the organization's strategic goals in defining decision making attributes, thereby being compliant with a pre-condition for strategic alignment. Other aspects such as the gains achieved in terms of justifiability, accountability, or reasonability which provide further arguments for their application were not considered.
2. The second part of this article was concerned with analyzing the contribution of approaches towards the success of the ERP project.

However, business management still fails to recognize the full spectrum of methodologies and methods available in this context, in particular, support by evaluation methods and follow-up analysis and applications such as structural analysis of system alternatives for evaluating organizational fit, or multiple attributive ERP controlling. The article focuses on implementing Educational

ERP in Universities / Institutes were they fulfill their requirements as per the strategic goals set and attributes of decision making.

P. Hawking., B. McCarthy., A. Stein published their paper onIntegrating ERP's Second Wave into Higher Education Curriculum[22] -Universities who have worked very hard to develop ERP curriculum are now in dilemma of evolving their curriculum to reflect the evolution of ERP systems and industry requirements. The evolution of ERP systems from an operational to a more strategic focus requires a different skill set to support this transition. The visiting lecturer delivery method could be further extended whereby a directory of specialist academics could be established by SAP and distributed to alliance members. These academics could be provided with additional support from SAP to assist them to further develop their curriculum with the goal of making it portable to other universities. Universities and ERP vendors need to develop strategies on how to best address the new skills shortfall. For this to occur there will be need of more collaboration than exists at present. This article focuses on the collaboration between organizations and Vendors, the implementation of Educational ERP in the organizations with operational to a strategic focus with different skill set to support this transition.

M. Schumacher.,S. Moser published their article on Adoption of ERP Software by a University System: Advantages and Challenges[18] **-** Over the last 10-15 years, organizations have been in growing numbers, turning to ERP (Enterprise Resource Planning) systems to consolidate their information technology infrastructure, streamline business processes, and help them become more efficient. The ERP software market has been very lucrative for both software developers as well as consultant firms. These systems are very large and complex, and as such, often require expert assistance for successful implementation. ERP systems tend to be very expensive, take a relatively long time to implement, and the massive task can sometimes take its toll on the staff tasked with its use and implementation. This will include a look at existing research in this area, investigation of common implementation pitfalls and identification of success factors for implementation of ERP systems. The researcher will find the baseline for comparison of similar Educational ERP (EERP) implemented by Colleges / Institutes / Universities.

S. Maheshwari., P. Singh., L. Tripathi published their research paper on ERP in Educational Institutions: SWOT Analysis[31] - ERP systems provide a mechanism for implementing systems where a high degree of integration between applications is required The Business Case or Value Proposition for implementation must be outlined to successfully implement - a proper mix of people, processes and technology should be maintained. This study has attempted to explore the issue of post-implementation success in ERP systems, conceptualize and empirically validate critical dimensions that contribute to post-implementation success, and offer implications that could be useful for both the practice and research on ERP implementation effectiveness. The lack of prior empirical findings in this area lends additional importance to such a research effort that explores potentially significant constructs and defines conceptual boundaries that could contribute to future empirical investigations. The researcher felt that there is a scope for further research on ERP usage in educational institutions and studying deeply the strengths, weaknesses, threats and opportunities of using an ERP in an educational institution. The author has written conceptual paper which can be further extended into an empirical value base research.

P. Kanthawongsin his article referred to Structural Model of Student Satisfaction in Web-based ERP-Simulated Learning Environments[24] - Student satisfaction in Enterprise Resource Planning (ERP) course offerings is a crucial part of the attempt to successfully promote higher education. This paper extends previous researches of the author using a structural model to investigate the relationships among attitudinal variables impacting to student satisfaction in Web based ERP-simulated courses. This study guides university administrators, educators, practitioners, or software vendors of how to create satisfied learning and training environment for ERP in education. It also indicates that learners' satisfaction with the instructor, perceived ease of use, commitment, and perceived flexibility are respectively related to learners' satisfaction with the course. The satisfaction with the instructor is the primary correlation of commitment. Interestingly, ease of use is positively related to satisfaction with the instructor. The study confirms that these relationships

represent the most important considerations for students and instructors in ERP-simulated enhanced courses.

This study guides university administrators, educators, practitioners, or software vendors of how to create satisfied learning and training environment for ERP in education. It also indicates that learners' satisfaction with the instructor, perceived ease of use, commitment, and perceived flexibility are respectively related to learners' satisfaction with the course. This article gives insights which will be replicated at other universities and other similar ERP courses to validate and compare the results in different contexts. Further studies can extend for the proposed model to determine which factors are likely to affect the satisfaction of stakeholders of using Educational ERP system.

E. Estelles., J. Pardo., F. Sanchez and A. Falco published their article on AModified Agile Methodology for an ERP Academic Project Development[5] - This article refers to the result of using a tailored agile methodology for the design, development and implementation of an ERP by a student of last course could be described as satisfactory. The student, in his relation with the customer and the company, has acquired knowledge impossible to acquire in the classroom. He had to plan the project, being able to experiment the problems and situations that a bad schedule or an undervalued task can cause. He has learnt to treat with a real customer, who has changed the requirements repeated times forcing him to be more flexible, with whom the student has been in constant and direct contact communicating via phone or mail using a correct and appropriate language and expressions. All these experiences have helped to train the student as a future Computer Science professional. As for the company, it has obtained the basic portion of the tool that will help in its material management and business process automation.

However, there exist some aspects to improve:

- Project size : Because of the time limitation, there are two options: to develop smaller and simpler projects, which allow the long use of all the XP practices by just one student or create at least two little teams (of two students each one) which should work in parallel but in constant

communication between them and with the client. This last option would complicate the client interaction. It's known that clients don't fully understand the benefit of regular developer-client interactions and don't want to be bothered.

- The available time: The time that a final course Project offers is limited: just one year at CEU-UCH studies. Such a short period has two important limitations: on the one hand it limits the size and complexity of the project, on the other hand, it doesn't allow the student to observe the software evolution.
- The team size: As it has been indicated, it would be preferable to have groups of two students, allowing the exchange of them between the different groups in order to use the "pair programming" practice and allowing the students to work with more students. It's important to teach the student to face up dynamic teamwork because it's one of the working characteristics more appreciated by firms. For further projects, smaller information systems for two student teams will be proposed. For improving the tutor evaluation process and for eliminating part of the documentation, new and different practices can be applied: the mutual explained qualification between the students after a module finalization or evaluation of the degree of ability acquired in the resolution of changes along the project. The objective is to use different kinds of deliverables different from documentation. The researcher has identified that there should be different ways of implementing Educational ERP system and use of technology, methodology and design patterns and process driven business of Universities / Institutes.

3.2. Identification of problems

J. Hughes.,R. Beer published article onA study of ERP security issues produced a checklist that shows institutions what to look for while letting vendors know what campuses consider important[10]Most of the attendees manage large enterprise systems, including ERPs, at their home institutions, and they recommended that institutions develop a comprehensive enterprise approach to security prior to ERP procurement. This enterprise approach, they noted, should be designed to include the ERP and its associated products, as

well as other current (and future) enterprise systems such as course management, e-mail, building-access management, and the myriad other systems that have assumed enterprise-level importance. The task force recommends that any higher education institution issuing a request for proposal (RFP) for a new ERP include a requirement that the vendor explain how the ERP will work with the institution's to prevent security flaws in the ERP. The researcher finds that before implementation of any Educational ERP in the organizations the security checklist has to be prepared along with the vendor's recommendation and myriad other systems that has to be integrated with the enterprise system.

A. Ahed., S. Louis published their article onA study of ERP security issues produced a checklist that shows institutions what to look for while letting vendors know what campuses consider important[1] - The amount of investment in these ERP systems has been substantial. In the last few years higher education institutions spent more than 5 billions in ERP investment. The aim of ERP implementation in universities is to provide colleges, schools and departments, with an enhanced ability for research and teaching at reasonable or low cost. Unfortunately however, it has been claimed that as many as 60% to 80% percent of all ERP systems fail to meet expected outcomes, while other implementations did not improve performance with users explicitly expressing dissatisfaction with performance. In light of these facts and due to the significant investments of resources made by organizations to adopt or shift to ERP system, researchers have a strong desire to explain the causes and the factors that lead to good performance with ERPs, what factors influence implementation success and failure and the reasons behind the problems that occur with the implementation of ERP systems. The Researcher has to study the amount of investment in implementing Educational ERP in Colleges / Institutes / Universities and percent of ERP system failure to meet the expectation. The researchers should find out the causes and factors and explain to the stakeholders.

M. Davis., Z Huang published their research paper on ERP in Higher Education: A Case Study of SAP and Campus Management[16] - This case study examines the application of ERP software to the student information

management in higher education at a Midwestern university that has replaced its legacy software with an ERP system. This paper also explores critical success factors (CSF) for a successful ERP implementation discussed in the literature. In addition, this paper investigates user acceptance of this new system specifically examining the staff attitudes, concerns expressed and comfort level for the average user. As per author the Impact/Effect of Specific Groups on Implementation Success depends on groups like Top Management, Academic administration, Financial administration, Human resources, Academic Departments and their direct supervisor but the researcher has to study the impact on those groups as well as the vendors group of people who are involved in success of implementing ERP in Colleges / Institutes / Universities.

P. Frantz., A. Southerland. and J. Johnson published their research paper on ERP software Implementation Best Practices[21] - There is no shortage of reports about failed ERP software Implementations in business and industry. Higher educations simply do not have resources to cushion themselves from failed implementations, so administrators would be wise to conduct and support research to discover what works best. The study highlights the importance of campus leaders understanding the complexity of the implementation process and managing the changes that occur. Higher education institutes / universities choose ERP software for the same reasons as business and industry - to operate more efficiently and effectively in order to remain competitive. Also like business and industry, higher educational Institutes / Universities must be capable of enabling organization change as part of the reengineering process. This study focus on the same reasons as business and industries implementing ERP software in the organization. The same level of competitiveness is between business, industry and higher educational institutes / universities for to operate more efficiently and effectively there is need of implementing Educational ERP system.

D. Allen., T. Kern., M. Havenhand published article on ERP Critical Success Factors: an exploration of the contextual factors in public sector institutions[3] - New information technologies have brought public sector higher education institutions (HEIs) into increased competition, while their

government funding in parallel has been continually eroded. In response to these growing pressures, there has been a call for HEIs to improve operational efficiency and to reduce duplication of resources by implementing advanced information systems that span the institution and improve processes. In response HEIs turned their efforts to implementing complex ERP systems.

The findings suggest that a careful use of communication and change management procedures to handle the often business process reengineering impact of ERP systems can alleviate some of the problems, but a more fundamental issue concerning the cost feasibility of system integration, training and user licenses may, in the end, impede ERP system utilization.

Critical Success factors of ERP Implementation are

- Strategic: Legacy systems, Business vision, ERP strategy, Top management, support, Project, schedule/plans.
- Tactical: Client consultation, Personnel, Business process, change and software configuration, Client acceptance, Monitoring and feedback.

The researcher will take this concept not only for the private educational sectors but also to the government and funded educational sectors were the outcome of this will be different for different scenarios.

J. Noguera., E. Watson published their article on Effectiveness of using an enterprise system to teach process-centered concepts in business education[12] - This article investigates whether the students performance, self-efficiency, and satisfaction are enhanced by the use of an enterprise system as a support tool for learning business process and enterprise systems concepts. This also talks about traditional instruction method and second and third methods are based on computer based learning by giving full access to the students and simulation access through ScreenCam movies.

The information collected can be used to build a body of student-learning process knowledge in the context of operational decision making involved for planning and executing utilization of ERP System.

The researcher has identified that whether the use of traditional and computer based with hands on experience and simulation process run parallel for

learning system will help the organization to come up with accurate / correct Information.

Y. Kim., Z. Lee., S. Gosain published article on Impediments to successful ERP implementation process[38]- This article talks about the one common issue faced by all organizations, which is that EERP software lacks some functionality to support existing business processes. Less successful organizations faced more problems with system expertise (perceived complexity of ERP software and only a few people in the organization with adequate understanding) and organizational support (lack of organizational change management expertise and managers not using system-oriented information to improve organizational performance). Relatively more successful organizations face issues of frequent ERP upgrade and a lack of human resources in terms of project implementation. This also provides insights for enterprises about the impediments they can expect to encounter in their enterprise system implementation projects. Our results suggest that, as is supported by anecdotal evidence, enterprises have not achieved significant success in implementing ERP systems. CIOs attribute problems with ERP projects to functional units frequently changing their requirements, not committing their human resources to the project teams, and not communicating enough with the project teams.

All these impediments are related to not receiving sufficient support from users and eventually lead to general project schedule changes, which CIOs perceive to be the most critical issue in ERP projects. When asked what problems they have actually faced, CIOs cited impediments related to human expertise in understanding ERP software and in managing large, enterprise-wide projects. They also suggested lack of organizational commitment to change management and functionally coordinating requirements among different functional units to be among the most serious problems they faced.

Our analysis of the association of these impediments to the success of ERP projects suggests that less successful companies have problems that stem from issues in the early stages of project initiation from organizational support and technical knowledge insufficiency. They fail to build organizational consensus and commitment to change.

They also concentrate more on the technical side of ERP knowledge, and consider having insufficient human resources to understand the overall design of ERP systems to be one of their critical problems. Relatively more successful companies encounter most of their problems in managing the project and in having a lack of human resources who can implement large-scale systems.

The researcher has to understand relatively more successful educational organization, as compared to less successful educational organization, make functional coordination a very critical issue, while less successful educational organization make software issues more critical.

C. Moller published article on ERP II: a conceptual framework for next-generation enterprise systems[2] **-** This article gives the emerging business requirements and conceptual framework for ERP II. The model compiled sets the concept into a comprehensive outline of ERP II and thus composes a generic map and taxonomy for contemporary corporate enterprise systems. The model is offered as a first step towards a tool to analyze the completeness of the ERP II vision in an enterprise to analyze the system from an ERP vendor. There is need of an instrument to measure the usage of the ERP II vision and also to enhance the conceptual framework to be able to measure which processes are used and how they are executed. This also argues about inter-organizational integration which is crucial to reaping the benefits of ERP II. ERP II is a new vision that has only recently been embraced by ERP vendors, and it will take a while before we are able to actually evaluate the impact of ERP II on Educational Institutes. It has also categorized ERP II as a non-disruptive technology based on the ERP theory and the retrospective analysis.

The researcher will mostly work on generic ERP concepts are needed and also have not yet managed to fully comprehend the complexity of internal process change. The tremendous challenges faced by the stakeholders and its inter-organizational business process integration, will emerge – the next challenge for researcher.

P. Ifinedo published article on Impacts of business vision, top management support, and external expertise On ERP success[23] **-** The purpose of this paper is to investigate the impact of such contingency factors as top management support, business vision, and external expertise, on the one hand, and enterprise resource planning (ERP) system success, on the other. It was found that the three contingency factors positively influence ERP system success. More importantly, the relative importance of quality external expertise over the other two factors for ERP initiatives was underscored. It is argued that ERP systems are different from other information technology implementations; as such, there is a need to provide insights as to how the above mentioned factors play out in the context of EERP system success evaluations for adopting organizations. As was predicted, the results showed that the three contingency factors positively influence ERP system success. More importantly, the relative importance of quality external expertise over the other two factors for ERP initiatives was underscored. The implications of the findings for both practitioners and researchers are discussed.

This article gives Researcher the future scope about efforts could examine the effects of other contingency factors such as organizational culture and structure on ERP system success. A large data sample should be sought. The study underscores the relative importance of external expertise over the other factors, it would be useful if future studies investigated what the qualities and attributes of a good provider of external expertise are. Also, efforts could aim at discussing the theme from the perspective of organizational size. The researcher identifies that studies could investigate other enterprise systems, e.g. CRM in educational / universities level. Such an exercise would increase our knowledge about the impact of relevant contingency factors on complex IT systems and would serve the adopters of such systems well regarding the sorts of factors to pay attention to in order to enhance the success or effectiveness levels of such systems. The study also identifies the impact and comparative study of EERP and Non-EERP Systems.

3.3. Effective Decision Making

L. Dyk published article on **A** Data Warehouse Model for Micro-Level Decision Making in Higher Education[14] - Despite the availability of powerful

computers, advanced network and communication infrastructures, and sophisticated software applications, university decision makers, still lack access to the critical information necessary for informed decision making. Business intelligence entails the gathering of data from internal and external data sources, as well as the storing and analysis thereof to make it measurable, so as to assist and sustain more efficient and decision-making. Considerable amounts of information and data are available and used to evaluate the effectiveness of the processes. The researcher will find the micro-level decision making for Colleges / Institutes / Universities with the help of Educational ERP (EERP) after implementing Business Intelligence (BI) on gathered information from internal and external data sources.

M. Joseph., M. Firestone., W. McElroy published article on Doing knowledge management", The Learning Organization[17] - This article tells about the importance of Knowledge management (KM) as a field has been characterized by great confusion about its conceptual foundations and scope, much to the detriment of assessments of its impact and track record. How to contribute toward defining the scope of KM and ending the confusion, by presenting a conceptual framework and set of criteria for evaluating whether claimed KM interventions are bona fide instances of it or are interventions of another sort. This paper also includes conceptual evaluation and critique of a variety of types of "KM interventions" and presentation of a detailed analysis of an unambiguous case where KM has been successful. The critical analysis indicates that the use of tools and methods associated with KM does not imply that interventions using them are KM interventions, and most "KM projects" are probably interventions of other types. The analysis also illustrates a pattern of intervention that can serve as the basis of a long-term systematic strategy for implementing KM.

The researcher finds that the strategies and tools used for sharing knowledge Management using enterprise resource planning should be used for solving the organizational problems and performance.

G. Joseph., A. George published their article on ERP, Learning Communities, and Curriculum Integration[7] **-** Through the SAP University Alliance, has achieved substantial progress in encouraging several universities to incorporate ERP into the business curriculum (Fernandez et al. 2000). However, introduction of ERP in education is a major investment in time and money. Technology is characterized by volatility and change. There is increasing pressure on ERP vendors to continue to innovate and modify products as new products are introduced into the market (Borck 2001; Shah 2001). Therefore, investments in ERP made by universities need to be carefully evaluated. Justification for the introduction of ERP is dependent on the long-term impact on pedagogy. That is, even after ERP systems are no longer the state-of the art, will using ERP as the basis of business education meet the objectives of pedagogy? This article argues that ERP systems help to address some challenges facing business education. These challenges can be understood from pedagogical and epistemological perspectives. Colleges are encountering challenges in pedagogy, particularly in enabling students understand, retain and apply material appropriately. In addition, knowledge areas in business education have been criticized due to the widening gap between academe and practice. The divisions between functional areas in business education, particularly in higher levels of education, also contribute to a blurred vision of the broad and interlinked aspects of business activity. ERP systems and learning communities applied to business education have the potential to address these challenges.

ERP-based education and learning communities are complementary, as the nature of ERP-based curriculum requires integration and restructuring of curriculums and cooperation on a scale that does not exist in current business education. Learning communities address several of these key factors through models that alter existing curricular structures and provide students opportunities for deeper understanding and integration of the material they are learning, while increasing interaction with one another and their teachers as fellow participants in the learning enterprise. Therefore, ERP can benefit through lessons learnt from the creation of learning communities. This also consists of the following sections. First, the environment of business and the

challenges facing business education is examined. This is followed by a discussion of learning communities and ERP systems, and provides a framework that portrays the role ERP technology can play in engendering learning communities and driving educational change in the desired direction. Finally, the areas that require caution and special care are highlighted.

The researcher has to identify the environment of business and the challenges to be faced by the organization / Institutes and further follow the way of imparting the knowledge to the stakeholders of EERP.

M. Davis., Z. Huang published article on ERP in Higher Education: A Case Study of SAP and Campus Management[16] **-** Enterprise Resource Planning (ERP) software has been applied to industries to support financial accounting, procurement, human resources, customer service management and supply change management. Recently, it is being promoted to new areas, for example, higher education. This case study examines the application of ERP software to the student information management in higher education at a Midwestern university that has replaced its legacy software with an ERP system. This paper also explores critical success factors (CSF) for a successful ERP implementation discussed in the literature.

The results listed in Table 2 reflect the highest percentage of responses the average user's perceived had an impact on the success of the ERP implementation at the university studied. The largest impact is perceived to be in both the academic administration and financial administration departments. It should be noted that at the university studied, both the financial and human resource modules of software were first to be implemented, but the average user feels the human resource department had no impact on the implementation success. In addition, it should be noted that 32% of the average users perceived their direct supervisor had no effect on the system success. This factor could also negatively impact a sense of personal "buy-in" of this new Campus Management system.

Table No. 3.1: Impact/Effect of Specific Groups on Implementation Success

Top management	28 % -- had a high effect
Academic administration	32% --greater than average effect
Financial administration	32% --had some effect
Human resources	20%--had no effect
Academic departments	28%--had some effect
Their direct supervisor	32%--had no effect

When it comes to user satisfaction, current literature finds that some user dissatisfaction is to be expected, and this is the same at this Midwestern university. The survey responses revealed concern among the regular users regarding the effectiveness of the new ERP, if the new system has improved their work processes and if they have had adequate support and training. Study of Critical Success Factors (CSF) has also revealed that user satisfaction is a critical part of the success of an ERP implementation. It is too early to determine whether user satisfaction will negatively influence this ERP implementation or not. More study will need to be done in the future to prove or disprove this theory.

The researcher will find the Critical Success Factors (CSF) and user satisfaction after implementing Educational ERP System in Institutes / Universities. Moreover the study should be done to prove their objectives, Strategies and decision making tool as Educational ERP system.

3.4. Infrastructure Facilities in Institutes / Universities

S. Maheshwari., P. Singh., L.Tripathi published their article on ERP in Educational Institutions: SWOT Analysis[31] **-** In the competitive market, an industry requires new business opportunities to increase their competitiveness. The Education industry is on edge of a radical change. The need of manpower is increasing with the growth in the Education industry, and a huge demand-supply gap is expected in the education space. To overcome these challenges resulting from such gaps, this industry needs IT solutions to manage its resources with optimal efficiency. To improve the quality of performance in its business applications, institutions are implementing ERP solution for the

functional areas such as student database, human resource, payroll, fees management etc. Its focus is to coordinate all the activities by facilitating communication and information exchange across departments and improve the quality of the activities. There is a growing awareness in most of the industries that IT could be used as a changing source of business functions. It is a planning philosophy enabled with software that attempts to integrate all the business processes. Before the ERP concept, each department had its own computer system optimized for the requirements that a department needed. This would result in local optima but could not ensure global optima across any organization. ERP combines all the business requirements of the organization together into a single, integrated software program that runs off a single database so that the various departments can more easily share information and communicate with each other.

ERP Implementation follows the six stage model, as given below:

Stage 1: Initiation- Top Management Vision and Need to Change

Stage 2: Adoption – Cost/benefit analysis and suitability

Stage 3: Adaptation – Implementation and availability of the system

Stage 4: Acceptance – Enhancing compatibility and Integration of functional units

Stage 5: Reutilizations – Acceptance of the system, using system through routine activity and enhancing performance

Stage 6: Infusion – Looking for the innovation to become more competitive

Three major processes seem to be followed for finalizing the system specifications in any organization. They are:

1. Studying the existing system
2. Mapping the existing system with ERP system
3. Analyzing the GAP and rectifying the GAP with Functional Team Members

Usually the following steps are followed for data migration the process of ERP Implementation:

1. Identifying the data to be migrated
2. Determining the timing of data migration

3. Generating the data templates
4. Freezing the tools for data migration
5. Deciding on migration related setups
6. Deciding on data archiving

The two Dimensions of Success are

1. Review of user learning
2. Evaluation of effective knowledge transfer (among project team members and other users)

The authors felt that there is a scope for further research on ERP usage in educational institutions and studying deeply the strengths, weaknesses, threats and opportunities of using an ERP in an educational institution.

3.5. Critical Success Factors (CSFs) influencing for implementing Educational ERP system

S. Azar. , M. Chaudhry in his thesis on ERP Implementation: Seeing through a lens", Master Thesis in IT Management[29] **-** This thesis talks about ERP development projects have been commonly affected due to budget overflows and unmet user needs. Hence, in a developer's viewpoint a successful ERP system is one which is accomplished on time and within the budget or even under budget. A high level management`s perception about successful ERP implementation system is referred to a system that decreases uncertainty of results, lowers the threats and controls the resources within the organization. It is impossible to consider a technological application as a success unless people have positive attitudes about it. The key success factors for implementing ERP system are people centered and thus user involvement is critical for the success of ERP implementation.

Researchers have suggested that due to cultural differences, there might be some differing views on issues such as success of ERP system implementation from various organizational stakeholders like IT professionals and business managers. Researchers propose that business managers such as CEO are more concerned with the "organizational-wide issues" while IT managers are mostly concerned with technological issues of ERP system. Hence, the success of ERP system implementation could be perceived differently within the

purchasing organization. However, the research conducted concluded that there was “little or no differences in how business managers and IT professionals” evaluated ERP success based on the user satisfaction measures.

The users of ERP system within the organization are most suitable group to measure Information systems success. They adopted user sanctification and perceived usefulness as metrics, to measure the success of ERP system. They suggested that perceived usefulness is main factor which affect user satisfaction within an ERP system. Researcher presented three ranks of employment in an organization;

1. Strategic level
2. Management level
3. Operational level

The strategic level groups make decisions about the organizational objectives and allocate the resources to achieve those resources. Management level group focus on assuring all organizational resources, human and financial are being used effectively and efficiently to achieve the goals set by strategic level leadership. Whereas, the operational level groups are involved in structured and specifically routine tasks under the supervision of the management level.

Researcher also found four most common stakeholders group classifications for the assessment of information systems, which are namely (1) strategic (2) management (3) end user and (4) technical staff. The validated model based on four quadrants representing four distinct but linked dimensions of ERP success.

1. Individual impact
2. Organizational impact
3. Information quality
4. System quality

A survey among the four classified stakeholder groups; all respondent groups did not report significant differences on System Quality dimension. The results from survey indicate that technical staff group showed significantly

different view of success on information quality dimension from other three user groups. Whereas, the perception of success for these three groups was similar for information quality dimension. Regarding the individual impact dimension, all respondent employment groups showed differences from each other, having different view of Enterprise system success.

This thesis gives insight of ERP implementation and the factors affecting the group of classified stakeholders' in organization. The difference in the opinion of Manager and IT Professionals differ with the culture and the background belongs too. The researcher will study mainly the Critical Success factors and rank them by giving preference which will help Universities / Institutes while implementing Educational ERP System.

K. Roman published their research paper on Benefits of Implementing an ERP[13] - An Enterprise Resource Planning (ERP) system implementation project will likely be among the most complex and demanding endeavors a higher education institution will attempt. A ERP project requires significant commitments of money, time and human resources from departments across the colleges / institutes / Universities. Many institutions experience a sense of excitement in anticipation of the benefits that come with a modern ERP system. The researcher will find the benefits of implementing Educational ERP system in colleges / Institutions / Universities looking at the complexity and demand.

S. Mohamed., T. Mclaren published their paper on the Gaps between ERP Education and ERP Implementation Success Factors[34] - This paper compares two streams of research related to ERP education and ERP implementation success factors. Many of the factors found to be associated with ERP implementation success are covered in the normative research on desirable skills outcomes for ERP educational programs. However, a gap analysis suggests several "soft skills" that are associated with ERP implementation success factors are typically overlooked. These gaps suggest that ERP education must place more emphasis on change management, organizational and employee resistance, and performance incentive schemes. These findings have implications for the design of ERP training programs and university level curriculum. The researcher should find out the internal and external

environmental factors which will affect the implementation and post – implementation of Educational ERP in Institutes / Universities.

Z. Huang published paper on a compilation research of erp implementation critical success factors[39] - This paper intends to serve three goals. First, it will be useful to researchers who are interested in studying ERP Critical Success Factors (CSF) field. Second, it will be a useful resource to find ERP CSF research topics. Third, it will serve as a comprehensive bibliography of the ERP CSF articles published during this 10 year period.

This research provides a comprehensive compilation of all previously identified ERP implementation success factors. However, several areas of future research seem promising. The first area is to fulfill this research with a larger literature sample size. This could increase the accuracy of the research. More literature review articles are expected as the field becomes more mature. The second area is to assess the difference among CSFs for different cultures or nations, for example, China or Japan vs. United States. The publication articles about CSFs in Chinese ERP implementation is increasing. The third area is to analyze this data in different way, like group them to different time periods. There are may be more significant findings. The last interesting area is to group these 37 CSFs into several groups, such as management or technique. Then compare them in different time periods. The variance could be even bigger. However the Critical Success Factors of business and industry are same as of running the educational ERP in Educational Institutes / Universities. The CSFs of Educational ERP system varies as we divide the time in different time frame.

P. King published article on The Promise and Performance of Enterprise Systems in Higher Education[26] **-** This article tales about Public and private institutions were equally likely to purchase ERP systems. The larger the institution, the more likely it was to implement an ERP system. Small institutions were evenly divided in their implementation of an ERP system. Thirty-three percent of the institutions installed all three modules, 37 percent installed two of three, and 31 percent installed only one. The primary reasons cited for not implementing all three modules are a deliberate and phased

implementation plan and, to a lesser degree, waiting for the product to mature in a later release.

The primary reason given for selecting a particular vendor was that the vendor's software had the best fit and functionality for the school. Next in importance were the architecture, the vendor's reputation and ability to provide a complete solution, and price. Perhaps surprising is the low weight given to outside advice.

Institutions were generally satisfied with their vendor relationships. Eighty-seven percent agreed or strongly agreed that the vendor was responsive to their needs during the sales process, and 65 percent agreed or strongly agreed that the vendor provided strong support after the purchase of the software. Nearly 10 percent of the institutions changed vendors during the course of an implementation process. Reasons given included a vendor's going out of business, a vendor's not delivering promised software on time, and the system office's mandating a new vendor.

Difficulty of the ERP Implementation

Respondents were asked to rate the difficulty of implementing ERP systems in comparison with other large technology projects. These projects were judged to be difficult. Implementing student systems is considered to be significantly more difficult than implementing either financial or human resources systems. The larger the institution, the more difficult for implementation, independent of the institution's Carnegie classification.

Customization

Thirty percent of the survey's respondents indicated that no modifications had been made to their systems; 50 percent had modified up to 10 percent of the code and 20 percent had modified more than 10 percent but less than 25 percent of code. Only nine institutions, or four percent, had modified more than 25 percent of code. The data show that typically when customizations were made, it was in conformity with a formal process, often involving senior management.

This article gives insights of doing implementation, customization and advice from outside parties to minimize the problems before and after implementing

Educational ERP system. Looking for the product to mature before implementation, the larger the institute more likely to implement Educational ERP system, the smaller the institute implementation is done partially.

S. Dezdar., S. Ainin published their research paper on ERP Implementation Success in Iran: Examining the Role of System Environment Factors[30] **-** This study resulted in important theoretical contributions.

1. First, this study has contributed to academic research by producing the empirical evidence to support the theories of CSFs and ERP implementation success. This research confirmed that ERP system quality and ERP vendor are positively related with successful ERP implementation.
2. Second, these findings are also important if the context of this research is taken into consideration. This research is probably the first to study ERP implementation projects in Iran from ERP system environment perspective. This research will thus add to the growing body of knowledge on ERP implementations in developing countries.
3. Third, this study developed a research model which could be applied into other Asian and developing countries to test its applicability or for those interested in cross cultural issues of ERP implementation success.

There are numerous paths for future research and extensions of this study. More studies can be conducted in developing countries in Middle-East, North Africa and other Moslem countries. At present, only a few studies can be found on the subject; thus, researchers have an opportunity to further explore the CSFs for these countries. Moreover, this study focused on those CSFs that relate with ERP system environment. Potential researchers could examine other group of CSFs relating to organization of ERP system and ERP project environment itself. Lastly, the target group of this survey was operational/functional/unit managers in ERP user companies. Future researchers could send out questionnaires to different groups of people involved in ERP implementation such as ERP project team members, consultants, chief information officers, and users.

The researcher will further explore on the critical success factors which relates to the post implementation of Educational ERP in Institutes / Universities. [5]

E. Cornelius published article on Who Should Lead Your Campus ERP Implementation[6] **-** This article decides whether the primary responsibility or "ownership" of the ERP belongs to the owner or should be led by the IT organization on campus or should it be "owned" by the appropriate functional administrative department(s).

Doing project work is a way of life for most information technology (IT) departments, while functional departments typically have little or no experience with projects the size of ERP implementations. So, many institutions choose to let IT lead the ERP implementation. Rarely is this decision successful. In the long-term, the ERP will be owned by the functional areas – they must establish the rules that govern system functionality; they must learn how the system will handle business processes within the department; and they must be able to obtain information by on-line inquiry or by creating their own reporting.

Therefore, we feel the ERP project's vision and direction should come from the functional departments. Then the IT organization is seen as the technological enabler of the institution's functional decisions and goals.

For example, with a student ERP system (which usually includes Admissions, Registration and Records, Financial Aid, Student Accounts, and related other functions), the leadership and direction should come from a respected manager in a student administrative function. Someone in the provost office such as an Associate Provost, or perhaps the Vice President for Enrollment management or the Registrar would be possible leaders, based upon leadership traits, experience, and availability.

The researcher finds that the failure of Educational ERP in the Institutes / Organizations depends on one of the factor – should the owner of the organization be the owner of the ERP system or the functional / business process implementer is the owner of the system. This may led to the success or failure depends on the owner of the organization. [5]

3.6. Cost of implementing Educational ERP, Hardware and services after sales

S. Arnesen published article on Cloud ERP solution right for you[28] - Cloud vendors claim that companies will realize the significant cost savings by using cloud solutions. Moving to a cloud Educational ERP system simply means that you are moving cost from an in-house expenditure to an out-sourced expense. The cost saving that cloud vendors tout comes from the fact that the initial up-front licenses fees are lower and that many internal costs can be eliminated to support the ERP system. These internal costs includes IT infrastructure, hardware, and the time required for personnel to support the on-premises Educational ERP system and install periodic upgrades.

On-premise ERP systems[41] usually require large upfront and ongoing investments to purchase and manage the software and the related hardware, servers, and facilities necessary to run it. If your company doesn't have a large or experienced IT staff, you may also have to also invest more time and money in additional personnel and train them. Even more importantly, on-premise systems require that your IT team spend a significant amount of their time and budgets' ensuring your system is up-and-running when you need it, including maintenance of hardware, server rooms, and more. When it's time for your ERP system to be upgraded, IT must then redeploy the system across the various users' computers and re-implement various customizations and integrations that your business installed on your previous software.

For cloud-based ERP, initial costs are typically much lower because you simply implement the software to your requirements and then access it through your computer's internet connection. The cloud ERP provider hosts and maintains all of the IT infrastructure for you, ensures the system is always running, that the data is secure and that product enhancements are rolled out painlessly to your solution without breaking your previously implemented customizations. Ultimately, this all allows your IT resources to focus on innovating and helping grow the business more effectively, rather than spending a disproportionate amount of their time on maintaining and managing your on-premise systems. Cloud ERP also offers a predictable, pay-

as-you-go subscription model that can make cash flow management and planning much easier.

Eakins has published in his article that different have sought to use approaches o measuring performance[39]. Some have used stock price as a proxy for firm value, drawing on the efficient market theory of finance that says markets do an efficient job of taking into consideration all relevant information when arriving at stock price. The researches find no excess return overall; however in cross-sectional analysis, they find that the market responds differently to announcements about innovative IT infrastructure investments vs non-innovative investments. They conclude that innovative investments increase the value of the organization but non-innovative investments do not.

3.7. Customization of Educational ERP Packages

R. Yanosky., M. Harris., M Zastrocky published their research paper on Higher-Education ERP in Transition[27] **-** The Educational ERP is Gradual Progressing toward Educational ERP II: The change and challenges meeting by the educational institutes due to change in pace of technology has gradually progressed from Educational ERP to Educational ERP II. Higher-education administrative suites are still moving toward ERP II functionality, extending the internal enterprise focus of traditional Educational ERP to include process integration and external collaboration. This research article shows that still what level we have to implement Educational ERP in organizations.

N. Pollock, J. Cornford published research paper on ERP systems and the university as a "unique" organization[20] **-** In this article there are "fuzzy" or unclear boundaries between universities / Institutes and other kinds of organizations, and while it is widely accepted that they engage in many of the same activities as others, they are still thought of as something a "bit different". Rather than try to put forward a definitive account of the identity of the university, we have described how ERP systems create tensions regarding this unique identity. The article has focused on how responsibility for the resolution of this similarity relationship is distributed during attempts to customize the system. Maintaining progress and paying attention to these processes it is possible to see how (and where) such issues are resolved. This

article shows that how difficult is to change in the traditional Educational ERP to include process integration.

P. King., R., Kvavik., J. Voloudakis published their research paper on Enterprise Resource Planning Systems in Higher Education[25] EDUCAUSE along with Cap Gemini Ernst and Young began qualitative and quantitative study of completed ERP implementation. To understand the need of implementing ERP systems in educational Institutes, the rationale for selecting specific system, critical decisions in the implementation process, the outcomes archived and next institutional plan to do. The researcher will find the factors influencing vendor selection, Modules implemented by the implementers, degree to which implementations stayed within budget, Adherence to original Implementation timeline, degree of customization, impact of ERP implementation on support costs and outcomes from ERP implementations.

L. Zornada has published in conference paper about considering the amount of money spent for the development of these three uniform information systems[33] in higher education in Slovenia, it is difficult to expect that any of the systems might be replaced or abandoned. It is also rather unlikely that in such a small and unique market as the market for ERP information systems for higher education, a development of a new system would be financially viable (despite the fact that some solutions occasionally appear, they are mainly of local character and do not have many users). The merging of existing systems, the introduction of a globally recognized vendor of ERP systems or a development of a new solution is reasonable and probable only at the level of university (UL), more universities or the state. ERP systems were first recognized as useful in manufacturing. With the introduction of global ERP solutions, enterprises have to organize and standardize their business activities. The end users are most often adapted to the information solution during implementation phases. Higher education environments are extremely dynamic, especially in Slovenia, where the education system has been fundamentally changed. A consequence of the wish to build up-to-date information support for business activities, but with material and regulatory inability to introduce a global solution, we are faced with the development of three equivalent integral information solutions in the field of higher education.

Despite the differences of individual approaches it can be expected that the future will bring a convergence of systems (at least from the functional point of). The role of the state could prove decisive, because it finances the development of individual solutions through projects. Higher education institutions and the state should leave behind the question of information support for business processes and should focus on informatics as one of the key factors of quality assurance in higher education. Organizing and standardizing the business process is the key factor for success of implementation of Educational ERP system in Institutes.

3.8. Security Systems for hardware and Software

S. Panday in his article on Major challenges in Auditing ERP Security[35] **-** Inadequate attention towards security, Implementers pay inadequate attention to ERP security during deployment. Many companies do not pay adequate attention to security implications of ERP configurations during the deployment and implementation of ERP systems. Implementation teams are usually tasked with finishing the implementation projects on time and within budget. They do not pay adequate attention to security implications since it increases implementation time and budget. Due to limited emphasis on security implications, ERP security becomes too lax, making post implementation problem identification and remediation very costly.

There is a shortage of manpower trained in ERP security. Most ERP training programs are designed for implementation efforts. They offer very little on ERP security and audit. Thus, there is a shortage of auditors who are trained in ERP security.

W. She & B. Thuraisingham published their article on Security for Enterprise Resource Planning Systems[36] - Security problems exist in every facet of an ERP system. These facets can be classified into three categories: network layer, presentation layer, and application layer, which include business processes, internal interfaces, and database. The security in application layer invests large efforts of the ERP experts to offer an effective way to secure the business data and processes. The technicians will also choose to activate/deactivate the security functions provided by the database

vendor according to the overall security solution. Security policy and administrator: ERP experts have to provide such a way that explicit and well-defined security policies can be easily defined and maintained. The security policies will offer the rules for the access of subject to object, and these are the constraints put on the administrators when they are granting/denying permissions to the users.

- User authentication: to verify whether the user is the same person as he claims. Separation of duties: tasks must be classified such that certain tasks can only be performed by certain users or roles.
- Authorization: to verify whether the user has access to the relevant resources. Depending on the authorization rules, the user is granted access.
- Time restriction: the access is permissible only during certain time. Log and trace: the logging and tracing of relevant events has to be done with preventing the log files from breach.
- Database security.

This article gives the traditional forms of physical spying[40] can still be applied. This can include any forms of unauthorized access to information. The most common forms of security threats to ERP are those made possible because of computer technology, including invasive electronic entry through some form of tapping or hacking. In addition to these security risk faced by all computer systems, two aspects of security are critical to ERP. One aspect concerns the quality of data generated and housed on the ERP. The other aspect is control over who can access data. One major benefit of a Web delivered system is the flexibility afforded to users through the ability to log on to the ERP system from any terminal. One difficulty is that providers use forms of caching to improve performance. There is serious risk arising software designed to turn off caches once the need for them has gone. Another form of control is a log-in page showing only those applications that the user is authorized to view. A digital certificate sign-on can act as one security measure with log-on to a directory protocol permitting access to authorized ERP applications. The ability to maintain ERP security in a Web environment is mandatory, given

that majority of ERP vendors are responding to demand to provide Web products.

The article from IT Harmony on security issue in ERP - Implementers pay inadequate attention to ERP security during deployment. Many companies do not pay adequate attention to security implications of ERP configurations during the deployment and implementation of ERP systems. Implementation teams are usually tasked with finishing the implementation projects on time and within budget. They do not pay adequate attention to security implications since it increases implementation time and budget. Due to limited emphasis on security implications, ERP security becomes too lax, making post implementation problem identification and remediation very costly.

On the other hand, auditing of ERP security is also a demanding area which requires proper attention. Though many steps have already been taken by various researchers worldwide, but for smooth and efficient functioning of business tasks in a better manner, there is still a need of many more initiatives to be taken in this direction.

Conventional Approach should be followed to solve Educational ERP security audits in today's era.

3.9. Impact of training on Educational ERP stakeholders

S. Maheswari., P. Singh published their article on ERP Implementation in Educational Institutions: Challenges and Opportunities[33] - Enterprise resource planning (ERP) systems are widely used by large corporations around the world. Recently, universities have turned to ERP as a means of replacing existing management and administration computer systems. In this context, ERP refers to the use of commercial solutions for both administrative and academic purposes by universities. Typical administrative functions may include human resources, accounting, payroll, and billing. Academic functions include recruitment, admissions, registration, and all aspects of student records. The top reasons universities adopt ERP solutions are to replace legacy systems, improve student service, transform enterprise processes, modernize computer systems, improve administration, and maintain competitiveness and increase operating efficiency. ERP attempts to integrate all departments and

functions across the organization onto a single computer system that can serve all those different departments' particular needs. Each of those departments typically has its own computer system optimized for the particular ways that the department does its work. But ERP combines them all together into a single, integrated software program that runs off a single database so that the various departments can more easily share information and communicate with each other. ERP vanquishes the old standalone computer systems in payroll, admission, library and the fees, and replaces them with a single unified software program divided into software modules that roughly approximate the old standalone systems. Most organizations across the world have realized that in a rapidly changing environment, it is impossible to create and maintain a custom designed software package that will cater to all their requirements and also be completely up-to-date. Realizing the requirement of user organizations some of the leading software companies have designed Enterprise Resource Planning software which will offer an integrated software solution to all the functions of an organization.

The further study should be conducted by the researchers are

1. There is a scope for in-depth studies to be conducted to better understand the functioning of an educational institution through a questionnaire and the major functioning areas where an ERP system could be of help.
2. There is a scope for further research on ERP usage in educational institutions and studying deeply the challenges and opportunities occurring in the process of ERP implementation.

3.10. Pre and post requisites of implementing Educational ERP system.

G. Sabau., M Munten., A. Bologa., R. Bologapublished their paper on an Evolution Framework for Higher Education ERP Systems[8] -The process of evaluating an ERP system for use in higher education requires that a university compare the existing ERP software available to their current processes and see which ERP solution will best fit the existing procedures. A special attention should be paid to organizational communication and human factors, which are significantly different from companies. Organizational communication is associated with several critical success factors, such as community involvement, change management and project management, and it has been

considered one of the most critical success factors. The adoption and implementation of an ERP involves high risks, mainly because of huge investment and the success rate to 30%. Also, integration costs are traditionally much higher than a customized integration plan for the software, hardware and consulting components through the implementation phase. The researcher should find the existing processes in Colleges / Institutes / Universities and check for best solution which will fit the existing procedures and critical success factors of pre and post implementation of EERP system.

According to H.Yen., C Sheu the study conducted on Aligning ERP implementation with competitive priorities of manufacturing firms: An exploratory study[9] - Many companies are following the trend toward making large investments in implementing ERP systems. At the same time, many of them did not even conduct a formal analysis or strategic plan prior to implementation. Even when a formal analysis was performed, it was generally limited to traditional ROI and payback methods. Considering the potential impact ERP systems could have on business competitiveness, it is no wonder that many firms failed to recognize the benefits of ERP because of the lack of planning at the strategic level. The research proposition of this study is that an ERP implementation should be aligned with a firm's competitive strategy. The results of this study reveal the following:

1. When firms choose to compete in flexibility and quality consistency, competitive priorities affect ERP implementation practices on the aspects of centralization, software customization, information sharing, type and effort of adaptation, and data accessibility.
2. Realizing the potential effects of competitive strategy on ERP implementation practices is necessary to enable managers to be more proactive in planning and implementation.
3. National culture and government/corporate policies can have a significant impact on the multi-national ERP implementation practices considering information sharing and local implementation practices such as the selection, configurations and maintenance of software packages.
4. Industry type does not appear to be a variable in choosing ERP implementation practices. For example, Companies NCQ and NoteF are

both from the computer industry, but they have very different implementation practices, while Companies ChemD and CareM share similar practices even though they are from different industries.

This article gives insight about implementing practices and policies for different educational Institutes / Universities. The impact of competitive strategy on Educational ERP practices is necessary to enable management for planning and implementation.

Summary

Literature material reviewed by the researcher focused on different aspects of Education ERP system. The main emphasis has been given on following factors: cost of Educational ERP system, training and influencing factors, sharing knowledge; contributing to knowledge pool; difficulty in changes to be made in existing stereotyped ERP systems; collaboration between organizations and vendors; the symbiotic relationship between ERP and Business Intelligence (BI); its complexities and demand; various parameters to choose a right vendor; the SWOT analysis of a college running ERP system; the security aspects with precautions need to be taken before the ERP implementation; risk factors involved; impact and effectiveness of these systems; the internal and external environmental factors to be affected; the competitiveness among all sorts of businesses; time factors involved; different ways of implementing Educational ERP system; deep study of practices, policies to be deployed; competitive strategy various aspects of ERP implementation; different evaluation and success factors of Educational ERP implementation; evaluation of generic and specific ERP concepts need to be studied; and such many more important factors.

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CHAPTER 4
RESEARCH DESIGN AND METHODOLOGY

4.0 Introduction

The study is related to the implication of Educational ERP implemented in Institutes/ Universities for better services in Pune District. The researcher has used survey based research methodology to carry out this research. In this research purposive convenience sampling method has been used for the purpose of data collection. According to data published by Institutes/ Universities, population of Institutes, Directors/Principals/HOD's, staff and learners respectively are 373, 12599 and 164418. This is out of necessary because it was found almost impossible to obtain perfect sample [2]. Due to unavailability of complete and reliable data about awareness and usage of Educational ERP System, therefore it is not possible to identify perfect population. The method of selection of sample is described in this chapter. And after that the nature of primary data and secondary data is explained.

This research project was conducted using a survey instrument administered online in Google Docs. Director/Principal, Administrator, Staff and learners were contacted via email inviting them to participate in the survey and providing them with a link to the survey website. Survey results will measure the perceived acceptance of the new system and what user factors affect a successful implementation. Also, this case will compare the CSF and best practices found in current research that have been found to improve the chance of a successful ERP implementation.

The process of identifying a sample to survey involved identification of key staff members who were impacted by the EERP implementation because their daily work was affected by this implementation. Groups identified to be invited to participate in this survey process include:

- University, Institutes and departmental Board of Director / Managing Authority.
- Key support staff members

- Learners of different University, Institutes and department.

In addition to this, researcher also used the traditional as well as online instrument (Google Docs) method of collecting data with the help of Questionnaires like Management (Owner, Principal/Director, Dean, HOD and Administrator), Staff and Learners of Universities/ Institutes. Additionally, white papers from industry sources will be used for background information along with traditional sources of professional journals and publications.

4.1 Statement of the problem

The information system suggest the reason for Educational ERP System that there is not much awareness of the advantages of using ERP, cost is a major hurdle in automation, lack of business process reengineering, insufficient planning time, improper technical support, users are reluctant to learn technology and insufficient ongoing training to the stakeholders. Managers of ERP implementation projects face extensive problems and challenges. However it appears that majority of literature has focused on critical success factors with less regard to different stakeholders' perspective. The stakeholders' perspective can be different from each other on different issues. A clearer understanding of CSFs related to various stakeholder groups would make it possible to find out if the perspectives of relevant stakeholders have been addressed in the ERP implementation. Not only do Educational ERP systems need plenty of time and money to implement, even successful implementation can disrupt organization culture, create extensive training requirement, and lead to productivity losses. Furthermore, many experts say that over 50 percent organization experience some degree of failure when implementing advanced information technology. Unfortunately, many organizations have already experienced significant troubles trying to implement Educational ERP systems and this poorly executed implementation have had serious consequences. Obviously, it is very important to identify and understand the financial impact of Educational ERP implementation on various Educational Institutes.

4.2 Scope of The Study

The study is related to the use of EERP system implementation and its impact on stakeholders. The geographical limitation of the study is in and around Pune District. This study is primarily focused on awareness and usage of EERP system implemented in Higher Education Institutes in Pune District. Also it focuses on CSF's with regards to different stakeholders using EERP systems in Educational Institutes. The scope of the research is limited to the number of Institutes from each category like **Technical and Health Science**. Under Technical science, different categories like Management, Engineering and Pharmacy are considered and in Health Science only one category Medical is considered in Pune District. The selection of respondents for the research is carried out for each Institute under the following category:

1. Board of Director/Managing Authority
2. Staff
3. Learner

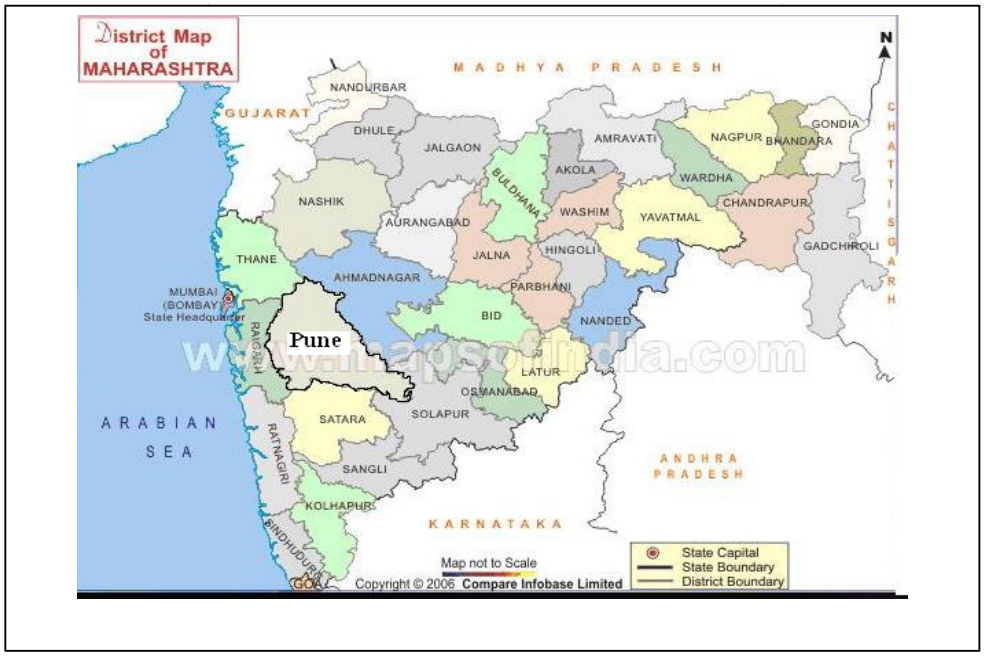
The researcher has considered the Pune District for the study since Pune [1] is the second largest city in the western Indian state of Maharashtra. It is known for its educational facilities, having more than a hundred educational institutes and nine universities, as well as its growing industrial facilities. Pune District is an administrative center and now an important industrial hub with reference to IT.

Pune is called "The Oxford of the East" by Jawaharlal Nehru, India's first Prime Minister, due to the well-known academic and research institutions in the city. Pune attracts students from every nook and corner of the world. Foreign students find Pune very peaceful and safe compared to other educational cities of India. Pune's economy is driven by its manufacturing industry, although information technology has become increasingly prominent in the last decade. Now Pune is transforming into a vibrant modern city with bubbling activities in the IT and Hi-Tech sectors. Pune is India's first wireless city. During the course of the present study the researcher has focused on the study of the impact of the EERP system implementation in Educational Institutes services and observes increase in efficiency of getting real time data

for decision making, Time saving, controlling and analyzing of Technical and Health Science Institutes in Pune District. The researcher has also done the comparative study between some of the CSF's of Management, Faculty and students after implementing EERP system.

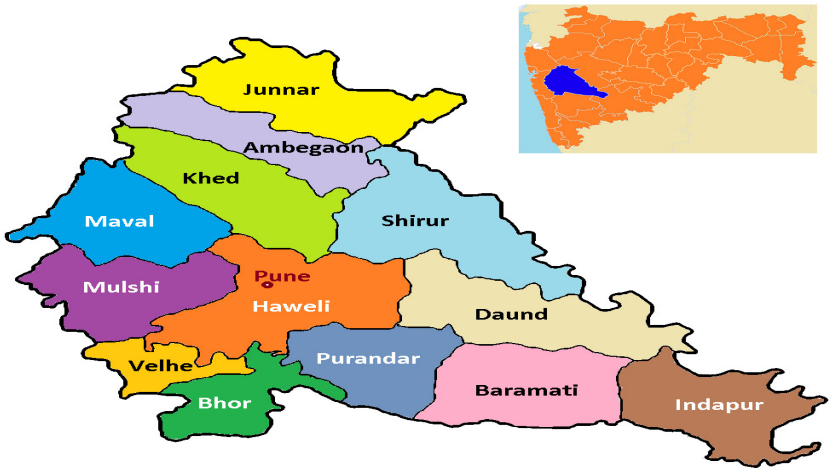
The geographical locations of Pune District are indicated by the map 4.1 and 4.2 as follows:

Map 4.1: Location of Pune district in Maharashtra



Source: www.mapsofindia.com

Map 4.2: Map of Talukas in Pune District



Source: http://www.mapsofindia.com/maps/maharashtra/pune.htm

4.3 Objectives of The Study

The researcher has set primary Objectives as given below:

1. To study the concept of educational ERP in different Technical and Medical Educational Institutes.
2. To study the present problems in Educational ERP System.
3. To study the degree of satisfaction of stakeholders of Educational ERP model.
4. To understand the cost of the proposed ERP systems as compare to the existing legacy System.
5. To design Framework of Educational ERP software based on our study.

4.4 Hypotheses of the Study

In consistent with the objectives, following hypotheses were formed by the researcher:

H1: Educational ERP leads to effective decision making in Educational Institutes.

H2: Educational ERP are very much cost effective as compared to legacy system.

H3: Infrastructure facility is not adequate for implementing ERP in EducationalInstitutes.

4.5 Importance of the Study

The implementation of ERP system has been continuing to grow in the public and private sectors and hence there is need of implementation of Educational ERP in educational sectors. It is also important that organizational leaders understand the issues with which they could be faced when implementing EERP. This study explore on different factors which affects EERP implementation in the educational sector. Educational ERP provides the platform for Institutes to progress from a paper centric to process centric organization. It also provides tools to automate the key academic processes and it provides means of measuring the throughput of the processes through numerical and graphic reports. Academic processes will be streamlined,

leading to smooth and fast functioning. Model suggested by researcher will be more cost effective and hence more Institutes can buy it. Decision making ability of management goes up, as a result saving time and enhancing effectiveness. Reduce human errors and efforts. Information from this study may be useful in determining how well the needs and expectations of other Universities/ Institutes have been met when implementing EERP [3].

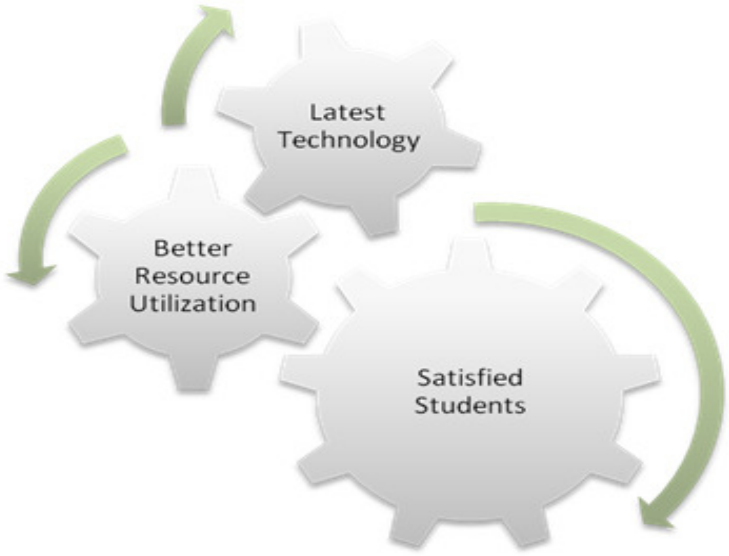


Fig No. 4.1: Source: Education ERP.net

Imagine your Institution to be wholly automated with no paperwork, no redundancy of data and most of all satisfied students who will be your best source for advertisement. This website has suggested the next generation ERP for education institutions which comes with the following benefits:

- Quick & streamlined flow of Information
- Improved existing processes
- Increased transparency & flexibility
- Improved Decision-Making Capability
- Improved utilization of resources
- Reduced Business process Cycle Time
- Increased Productivity [3]

(**Source:** Education ERP.net)

4.6 Research Methodology

This research study is related to the use of educational ERP system implemented by University/ Institutes in Pune district. It utilizes both primary and secondary data. The secondary data utilizes already available information both published as well as unpublished. For primary data however such a facility is not available and it has to be collected by using the survey method. The scope of research is limited; the survey is undertaken by obtaining a stratified sampling technique. The description of the research methodology required for the process of obtaining a sample as well as the nature and size of sample should be adequately explained. A stratified sampling technique involves the selection of respondents based on the important characteristics under study such as implementation of EERP in Institutes and specific knowledge related to the research problem.

4.6.1 Primary data

Data were collected via a survey method designed by the researcher. The researcher created a survey instrument based on the benefits of implementing EERP and the critical factors affecting an EERP implementation as defined in the review of literature. As the instrument was developed, it was periodically reviewed by EERP professionals and modified based on their suggestions.

Primary data are obtained through a survey. Such data is first hand and original in nature. Several methods are used for collecting primary data like telephone survey/email survey, mail questionnaire, personal observation, interviews and online Google application like Google docs **http://docs.google.com**. Particularly in survey, the important ones are – observation, interview, questionnaire, schedules, email survey, telephone survey etc. Each method has its advantages and disadvantages. The primary data collected by the researcher is explained in the following manner:-

4.6.1.1 Selection of the District

The researcher has selected Pune District as it is “The Oxford of the East", educational and IT Hub. The researcher has also ascertained that there is scope for the implementation of Educational ERP system which can benefit to the stakeholder and measure the performance.

4.6.1.2 Selection of Institutions

Researcher has an objective of finding listed Universities / Institutes in and around Pune district who have implemented or in the process of implementing Educational ERP system. In order to know the number of Institutes / Universities in Pune district researcher has extensively used the data provided by AICTE, DTE , Statutory, Private and Deemed Universities web portals to get institute number.

A sampling is used by considering two categories i.e. Technical and Health science, these categories further divided into number of strata's viz Management, Engineering, Pharmacy and Medical, Dental, Ayurved and Unani, Homoeopathy, Allied Health Sciences, Occupational Therapy, Basic B.Sc. Nursing, Post Basic B.Sc. Nursing, BASLP and BPO respectively. For study purpose 373 institutions have been selected from each Strata like 23 Management institutes from 232 institute, 19 Engineering institutes from 75 institutes, 5 Pharmacy institutes from 30 institutes and 9 medical institutes from 36 institutes. Hence total number of sample size of institutes is 373, which is shown in following table 4.1.

In order to choose the institute, a **Stratified Disproportionate Sampling** is explained and accordingly, the total number of institutes are grouped into two strata's viz, Technical (Management, Engineering and Pharmacy) and Health Science (Medical, Dental, Ayurved and Unani, Homoeopathy, Allied Health Sciences, Occupational Therapy, Basic B.Sc. Nursing, Post Basic B.Sc. Nursing, BASLP and BPO). Thereafter, stratified disproportioned sampling is used to choose the number of institutes from each category like Technical and Health Science. Under the sampling design the entire population of institutes is divided in strata which are mutually exclusive and collectively exhaustive. The Institutes size of sample in each stratum is disproportional to the size of the population of strata as shown in following table 4.1.

Table 4.1: Selection of Institutions

Sr. No.	Category	Strata Name	Total Institutes	Respondents	Total Population	Proportion
1	Technical	Management	232			
				Management Board of Director / Managing Authority	232	23
				Staff	5800	143
				Learner	62240	122
2		Engineering	75			
				Management Board of Director / Managing Authority	75	19
				Staff	5924	182
				Learner	88860	222
3		Pharmacy	30			
				Management Board of Director / Managing Authority	30	5
				Staff	430	24
				Learner	6488	16
4	Health Science	Medical	36	Management Board of Director / Managing Authority	36	9
				Staff	445	37
				Learner	6830	32
Total					**373**	**56**

Note: The Establishment of Institutes/Departments is above Three Years and Number of students is above Five Hundreds.

4.6.1.3 Selection of Board of Director / Managing Authority, Staff and Learner

Population of each stratum is not same as per different respondent like Management Authority, Staff and Learner. For the purpose of data collection, disproportionate allocation of sample size is considered because each stratum is not the same as per different category. Stratum 1 is considered for Technical and Stratum 2 is considered for Health Science. Hence for study purpose, researcher has used **Stratified proportionate** sampling method for **Board of Director** and **Stratified disproportionate** sampling method for **Staff and Learners** which is shown in Table 4.2.

Table 4.2: Selection of Board of Director / Managing Authority, Staff and Learner

Sr. No.	Category	Strata Name	Respondents	Total Population	Sample Size
1	Technical	Management			
			Management Board of Director / Managing Authority	23	23
			Staff	723	143
			Learner	13600	122
		Engineering			
			Management Board of Director / Managing Authority	19	19
			Staff	1325	182
			Learner	21000	222
		Pharmacy			
			Management Board of Director / Managing Authority	5	5
			Staff	76	24
			Learner	1448	16
2	Health Science	Medical			
			Management Board of Director / Managing Authority	9	9
			Staff	160	37
			Learner	2700	32
Total					56

For collection of data researcher has applied **Stratified proportionate** sampling method for **Board of Director** and **Stratified disproportionate** sampling method for **Staff and Learners**

Data related to the study revolves around the management decisions whether ERP system should be implemented or not because of that researcher has taken 100% data from 1st group of Management Board of Director / Managing Authority i.e. Director / Principal, HOD, DEAN or Administrator. As 2nd group staff belongs to large number of population hence researcher has collected 20% from Management, 14% from Engineering, 32% from Pharmacy and 23% from Health Science from the population and 3rd group of learner which is larger than the 2nd group hence researcher has collected 1% of sample size from the population. (Krejcie,

Robert V., Morgan, Daryle W., "Determining Sample Size of given population)

4.6.1.4 Selection of Sample

4.6.1.4.1 Selection of Board of Director / Managing Authority

In order to study the effectiveness and efficiency of implementing EERP System in Universities / Institutes the major role it plays for taking decision to implement are taken by **Board of Director / Managing Authority** of different category. Researcher has collected the data from Managing Authority of those institutes which have successfully implemented EERP system are shown following table 4.3.

Table No. 4.3: Total No. of Board of Director / Managing Authority

Category	No. of Institutes	Respondents
Technical		
• Management	23	23
• Engineering	19	19
• Pharmacy	5	5
Health Science		
• Medical	9	9
Total	**56**	**56**

The total strength of Board of Director / Managing Authority is equal to the number of Institutes. Total numbers of Institutes in Pune district are about 373 from all categories, out of which 56 institutes have been selected for the study. Researcher has taken 100% data from the institutes from respective category.

4.6.1.4.2 Selection of Staff

For the present study staff were selected from each Institutes which has been successfully implemented EERP System from Pune district by using purposive sampling technique. Researcher has selected only that staffs, who actually works on EERP System. From selected Institutes researcher has taken 20% from Management, 14% from Engineering, 32% from Pharmacy and 23% from Health science staff members for collection of data. All the

selected staff members were personally interviewed by the researcher. Some of the Information is also collected by conducting group discussion with the selected staff members. During fieldwork it was found that very few staff members from each Institute were using the EERP system on regular basis. Table No 4.4 shows the information of total number of staff members and sample selection from each category. Total 386 staff members are considered from Technical and Health Science Categories. From Technical category 349 respondents and from Health Science 37 respondents are considered from select institutes.

Table No. 4.4: Category Wise Sample Distribution of Staff

Category	Staff Respondents
Technical	
• Management	143
• Engineering	182
• Pharmacy	24
Total(A)	349
Health Science	
• Medical	37
Total(B)	
Total(A+B)	**386**

4.6.1.4.3 Selection of Learner

Population of learner in Pune District is very high i.e. approx. 1,64,418. Hence for study purpose researcher has used stratified proportionate sampling method (approx. 1%) from each category, 360 learners from Technical category and 32 learners from Health science category were considered for study purpose as shown in following table 4.5.

Table No. 4.5: Category Wise Sample Distribution of Learner

Category	Staff Respondents
Technical	
• Management	122
• Engineering	222
• Pharmacy	16
Total(A)	**360**
Health Science	
• Medical	32
Total(B)	32
Total(A+B)	**392**

The survey was separated into three different categories like Management, Faculty and Students. In **first category**, Management has to address research questionnaire by asking questions regarding Critical Success Factors (CSF's), Objective of implementing Education ERP system, compare the cost of legacy system and existing system i.e Educational ERP system, customization and IT up gradation policy, adequate Infrastructure facilities, customization , security issues, No. of modules Implemented, access control plug-in used to communicate and transfer information to the stakeholder, check performance of the EERP system, training provided by vendors and MIS reports for proper decision making by Management like Director / Principal / HOD's of Institutes / Universities.

For **second category** Faculty has to address research questionnaire by asking questions regarding Critical Success Factors (CSF's), Objective of implementing Education ERP system, No. of modules Implemented, Input / Output and operation of EERP system User friendliness, Mode of communication and transfer information to the stakeholder, check performance of the EERP system, training provided, satisfaction from management about problem solving capabilities of EERP system and decision making tools or MIS reports for decision making.

For **third category**, Students has to address research questionnaire by asking questions regarding Critical Success Factors (CSF's), No. of modules

Implemented, Input / Output and operation of EERP system User friendliness, Mode of communication and transfer information to the stakeholder, check performance of the EERP system, training provided, feedback of EERP system by management, satisfaction from management about problem solving capabilities of EERP system and decision making tools or MIS reports for decision making.

4.6.2 Population

After searching theAICTE, Universities and private institutes web portals it has been revealed that there are around 373 institutes along with one Statutory and nine Private University. Upon further analysis of the list it is found that only 56 institutes were using Educational ERP system. The list can be further filtered according to the following criteria

- The Institutes and Universities must be located in Pune District as Shown in Map of Pune district.
- They should belong to different institutes running courses like Management, Engineering and Medical.

While collection of data we have decided to include all the flavors of EERP systems including indigenous systems to ensure overall reliability and avoid analyzing effect of particular EERP systems by make or type.

Further the Institutes / Universities from which the questionnaire is received will be selected for analysis which will give clear idea of implementing Educational ERP system or not.

The report of world conference on higher education from unesco says that rising demand with a 53 per cent increase in enrolment worldwide as well as greater diversification of providers, many a mixture of public and private that offer degree and non-degree subjects. Furthermore, as a result of globalization 20 per cent of students now spend some time studying in a country other than their own.

4.6.3 Sample Size

Researcher at the beginning of research was not having any idea about how many of these Institutes / Universities are using EERP system? Hence it was

decided to send the questionnaire to all of these Institutes / Universities and in order to get better representation it is decided that minimum of 40 institutes under Management, Engineering and Medical be covered in the survey.

EERP system covers the entire areas of operation like Administration, Human Resource Management, Finance Management and Planning. A comprehensive questionnaire was designed to understand the Critical Success Factors (CSF's), Objective of implementing Education ERP system, compare the cost of legacy system and existing system i.e Educational ERP system, customization and IT up gradation policy, adequate Infrastructure facilities, customization , security issues, No. of modules Implemented, access control plug-in used to communicate and transfer information to the stakeholder, check performance of the EERP system, training provided by vendors and MIS reports for proper decision making by Management like Director / Principal / HOD's of Institutes / Universities.

4.6.4 Respondents

EERP systems cover the entire areas of operation and have various module integrated with other. These modules are interdependent and cannot work in isolation unless specified for certain sub functions. It is hard to find respondent to know all the functional area of Institutes / Universities. i.e. a person from finance finds it difficult to answer questions from Human Resource and Management decision area and vice-versa. Hence it is decided to send questionnaire to people working in different courses of the same Institutes / Universities and later club responses functional area wise.

Respondents are from three categories are chosen to provide better representation of each side. The three categories are Management, Faculty and Students.

4.6.5 Secondary Data

The Secondary data is used to study the awareness and usage of EERP system Implemented in different Institutes with the help of earlier research studies made by others. It is also used to find out the merits and demerits and limitations of implementing EERP system and its present awareness with the

help of available data. It is helpful to study the objectives and hypotheses framed for the present study.

The secondary data is collected from reputed journals and magazines, newspapers, articles, internet websites and archives. For collecting this data the researcher has visited various libraries. A few of these libraries are Jaykar Library (Pune University), Yashada, Tilak Maharashtra Vidyapeeth Library, British Library, Sinhgad Institute of Management Library and Indsearch Library.

4.7 Data Collection Process

4.7.1 Pilot Survey

A pilot survey was executed before conducting the main survey. The purpose of this pilot survey is to examine whether or not the proposed questionnaire was well developed to analyze the benefits of EERP system. It is also examined how well the survey is designed for respondents to answer properly. Pilot survey is conducted for more than 10 Institutes which has provided vital inputs for

- Various functional areas to be included on which the questions are required to be based.
- Exclusion of less important areas
- Types and form of questions to be asked depending upon the user perception
- Feasibility of the survey method
- Any other areas which need improvement

4.7.2 Reliability Testing

Researcher used likert scale of five to take responses from the respondents. Researcher has taken 130 variables on likert scale. Initially researcher has taken responses from 20 respondents. To check the consistency of the questionnaire to be administered researcher has applied the **Cronbach's Alpha** reliability test.

It is observed that the questionnaire to be administered is consistent throughout the respondents

For **Board of Director** (**Cronbach's Alpha** =0.797), **Staff** (**Cronbach's Alpha** =0.860) and **Learner** (**Cronbach's Alpha** = 0.830).Further researcher can conclude that the same questionnaire can be administered for the further research.

Table No. 4.6: Reliability Statistics for Board of Director

Cases	N	Cronbach's Alpha	N of Items
Valid	20 (100%)		
Excluded[a]	0	0.797	107
Total	**20 (100%)**		

It is observed that questionnaire is consistence and Cronbach's Alpha score is 0.797. It means 79 percent respondents understood the questionnaire. Thus researcher concludes that this questionnaire can be administered for the further research. The sample of 56Board of Director / Management was selected for the purpose of study.

Table No. 4.7: Reliability Statistics for Faculty

Cases	N	Cronbach's Alpha	N of Items
Valid	102 (100%)		
Excluded[a]	0	0.860	80
Total	102 (100%)		

It is observed that questionnaire is consistence and Cronbach's Alpha score is 0.860. It means 86 percent respondents understood the questionnaire. Thus researcher concludes that this questionnaire can be administered for the further research. The sample of 386Staff was selected for the purpose of study.

Table No. 4.8: Reliability Statistics for Learner

Cases	N	Cronbach's Alpha	N of Items
Valid	157 (100%)		
Excluded[a]	0	0.830	47
Total	157 (100%)		

It is observed that questionnaire is consistence and Cronbach's Alpha score is 0.830. It means 83 percent respondents understood the questionnaire. Thus researcher concludes that this questionnaire can be administered for the further research. The sample of 392Board of Director / Management was selected for the purpose of study.

4.7.3 Learning during Pilot Survey

After searching the AICTE, Universities and private institutes web portals it has been revealed that there are around 325 institutes (Management, Engineering and Medical) along with one Statutory and nine Private University. Upon further analysis of the list it is found that only 50 institutes were using Educational ERP system.

During the pilot survey it was observed that a respondent working in particular modules and working as top level management there were variation in selecting the choice from the questionnaire to reduce the variation it was decided to take only one respondent of top level management from the Institutes. This has yielded good result as responses were collected from many respondents from different Institutes.

Few respondents find to be confused about certain questions, those questions were reframed to improve understanding and context in which it is asked. Few questions were added as suggested by some respondents and researcher scholars.

4.7.4 Confidentiality and Ethical Issues

All participants were notified of their rights according to research ethics process. It was made clear to the participants that their participation in this research was both voluntary and anonymous. To ensure confidentiality, the process of data gathering and processing was anonymous. Further the data was analyzed without identifiers.

The data collected is of official nature and involves information of confidential nature; it was declared in the questionnaire that all data collected was for research purpose only. Regarding the feedback participants were informed that no data be send individually and will be available only in the dissertation format.

4.7.5 Final Survey

Researcher benefited a lot after pilot survey and accordingly the main survey questionnaire was modified. During pilot survey it is found that internet based survey tools can play important role in time saving and accuracy of survey. Further it also eliminated the need for personal engagement and surveyor can reach more respondents by eliminating geographical limitations.

After evaluating many internet based survey sites researcher finely zeroed down on **http://docs.google.com**. [1] Finely Google.com is used for creating online version of questionnaire and their addresses are shown in following Table No. 4.9

Table No. 4.9: Address of Google docs Questionnaires

User	Address
Management : Managing Authority, Principal, Director, Dean, HOD and ERP Coordinator	**https://docs.google.com/spreadsheet/viewform?formkey=dEVmemNRbmtqNC03OVdQQW1Ic1hpWlE6MQ**
Faculty : Administrative staff, faculty	**https://docs.google.com/spreadsheet/viewform?formkey=dExkbERvQVNZZE54X2paODN6eDM0bmc6MQ**
Student: Learner	**https://docs.google.com/spreadsheet/viewform?formkey=dGJEMmVxMFF3RkZhbmtZbDlhM2ZodUE6MQ**

Researcher have also collected written questionnaire from many respondents to get better understanding and insight of EERP Stakeholders.

4.8 Summery

Data collection was tedious process and after tireless effort of more than one year researcher was able to collect data from **834**respondents which was merged to create a set of **56** Institutes out of which **47** Technical Institutes and **9** Institutes from Health Science category. Extreme care has been taken at this point to eliminate redundant data and few Institutes having redundant data were drop from the final set. At the end files suitable for statistical analysis was prepare after coding.

References:

1. https://docs.google.com Date: 05/05/2011 time: 11:00 am
2. http://www.dtemaharashtra.gov.in Date: 07/07/2012 time: 10:00 am
3. http://www.EducationERP.net Date: 06/06/2012 time: 12:10 pm
4. http://www.uis.unesco.org Date: 10/07/2012 time: 1:00 pm

CHAPTER 5
DATA PRESENTATION, ANALYSIS AND INTERPRETATION

5.0 Introduction

This research is related to the study of Educational Enterprise Resource Planning (EERP) in Technical and Health Science Institutes in Pune District. The researcher has tested positively the hypotheses of this research study, with the help of primary and secondary data. For the purpose of the study, samples are divided into three parts. Part I is about Board of Director / Management who take decision, Part II is about Staff who avails the services of EERP to Management and Learners and Part III is about Learners who avails the services of EERP to get the information from Management and staff. The researcher has selected three samples and collected data from them. The first sample consists of 56 Board of Director/ Management, the second sample has 386 Staff and 392 Learner from various Technical and Health Science Institutes from Pune District. They are shown in **Table No.5.1**

Table No. 5.1: Selection of respondents from Institutes

Sr. No.	Course	Institutes	Respondents from Board of Director / Management	Respondents from Staff	Respondents from Learners
1	**Technical**				
	Management	23	23	143	122
	Engineering	19	19	182	222
	Pharmacy	5	5	24	16
	Total(A)	**47**	**47**	**349**	**360**
2	**Health Science**				
	Medical	9	9	37	32
	Total(B)	**9**	**9**	**37**	**32**
	Total (A+B)	**56**	**56**	**386**	**392**
Grand Total					**834**

Table no. 5.1 shows the distribution of respondents from courses under categories Technical and Health science. From first category Technical

categories management courses respondents from board of director / management 23 respondents, staff 143 and 122 from learners. Further from engineering course respondents from board of director / management 19 respondents, staff 182 and 222 from learners followed by pharmacy course respondents from board of director / management 5 respondents, staff 24 and 16 from learners. From second category Health Science only we have medical courses respondents from board of director / management 9 respondents, staff 37 and 32 from learners.

The data is collected through interviews and questionnaires and compiled from tables of Board of Director / Management, Staff and Learner for EERP system in Pune District. Statistical parameters and graphics have been used wherever necessary and useful. The data analysis is grouped in 3 parts as follows:-

A) Presentation and Analysis of Data I: Board of Director / Management

In Part I, the primary data about 56 Board of director / Management from 56 Institutes from Technical and Health Science in Pune District has been collected by the researcher (Para 3.7.1 D- i). An analysis is carried out under broad headings as follows:

1. Period of Implementation of EERP in Educational Institutes
2. Educational ERP modules
3. Training and duration of training provided
4. Factors influence to implement EERP system
5. Mode of communication
6. IT up gradation policy
7. Security Levels implemented on Application
8. Vendors Recovery Action and duration of Solving problem / Bug
9. Feedback and frequency of Feedback taken
10. Pre and prior Customization of Educational ERP system
11. User Interface and Performance of Educational ERP system
12. Usages of Educational ERP System
13. Educational ERP Provide better management tools
14. Cost of Legacy system, Cost of Your Educational ERP software system and Cost of Hardware and software

15. Vendors providing Educational ERP system
16. Cost of Training and Maintenance and Cost Related Influencing Factors
17. Infrastructure and Parameters of required infrastructure facility for implementing Educational ERP system
18. Business process re-engineering and request for business process re-engineering
19. Access Controls and types of Access control Plug-in used

B) Presentation and Analysis of Data II: Staff

In Part II, the primary data has been collected by the researcher with respect to 386 Staff from the Institutes of Technical and Health Science(Para 3.7.1 D - ii). For the purpose of the study, the researcher has selected Staff from various departments of Institutes who actually work on Educational ERP. The Staff's analysis is carried out under broad headings as follows:

1. Educational ERP modules
2. Training and duration of training provided
3. Mode of communication
4. Security Levels implemented on Application
5. Vendors Recovery Action and duration of Solving problem / Bug
6. Feedback and frequency of Feedback taken
7. User Interface and Performance of Educational ERP system
8. Usages of Educational ERP System

C) Presentation and Analysis of Data III: Learner

In Part II, the primary data has been collected by the researcher with respect to 392 Learners from the Institutes of Technical and Health Science(Para 3.7.1 D - iii). For the purpose of the study, the researcher has selected Learners from various departments of Institutes who actually work on Educational ERP. The Learners analysis is carried out under broad headings as follows:

1. Educational ERP modules
2. Training and duration of training provided
3. Mode of communication
4. Security Levels implemented on Application
5. Vendors Recovery Action and duration of Solving problem / Bug

6. Feedback and frequency of Feedback taken
7. User Interface and Performance of Educational ERP system
8. Usages of Educational ERP System

5.1 Concept of educational ERP in different Technical and Medical Educational Institutes

5.1.1 Period of Implementation of EERP in Educational Institutes

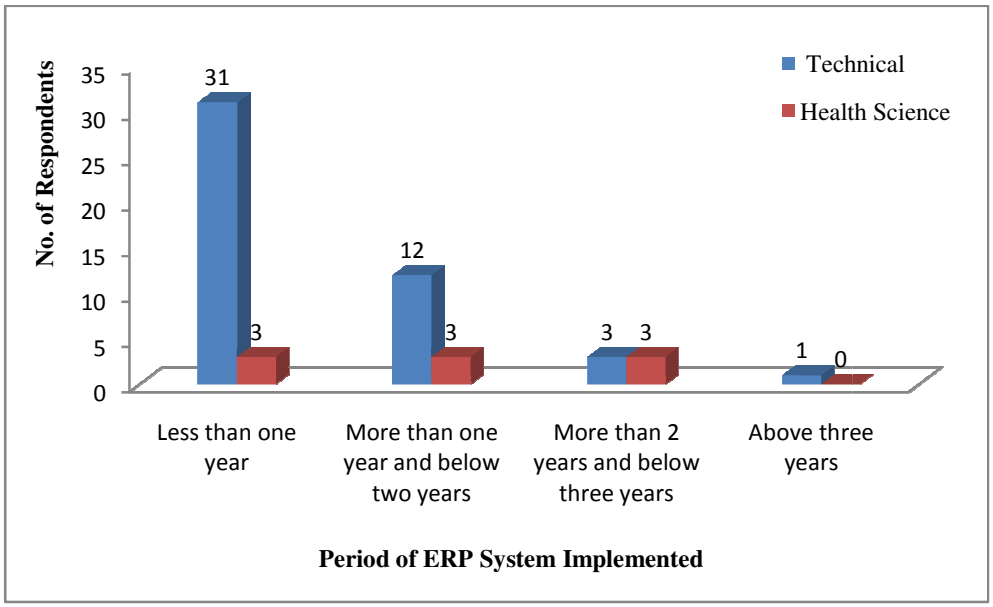
Table No. 5.2: Duration of implementing EERP in organization

Period of ERP System Implemented	No. of Respondents From Technical	No. of Respondents From Health Science
Less than one year	31 (65.96)	3 (33.33)
More than one year and below two years	12 (25.53)	3 (33.33)
More than 2 years and below three years	3 (6.38)	3 (33.33)
Above three years	1 (2.13)	0
Total	**47**	**9**

Figures in bracket indicates Percentages

The above Table No. 5.2 talks about data collection from 56 respondents out of which 47 respondents from Technical and 9 respondents from Health Science category. The period of implementing EERP system 65.96 percent respondents implemented in less than one year for technical and 33.33 percent respondents for Health Science category, 25.53 percent respondents Institutes implemented EERP system for more than one year and below two years for Technical Institutes and 33.33 percent respondents implemented EERP system for more than one year and below two years for Health Science Institutes. Further 6.38 percent respondents implemented EERP system for more than two years and below three years for Technical Institutes and 33.33 percent respondents implemented EERP system for more than two years and below three years in Health Science Institutes followed by only 2.13 percent respondent's implemented EERP system above three years in Technical Institutes.

Graph 5.1: Duration of implementing EERP in organization



The Graph 5.1 clearly indicates period to Implementation ERP system by Institutes from less than one year, More than one year and below two years, More than 2 years and below three years and above three years. Researcher has collected data from 47 technical institutes and 9 Health science Medical Institutes. Most of the institutes have implemented EERP system less than one year is 65.96 percent for Technical and 33.33 percent for Health Science. Further 25.53 percent Institutes have implemented EERP system for more than one year and below two years for Technical and 33.33 percent for Health Science. Followed by 6.38 percent respondents implemented for more than two years and below three years for Technical and 33.33 percent for Health Science. Only 2.13 percent Technical Institutes have implemented EERP system above three years.

Summary:

As compare to the Technical and Medical Institutes implementing Educational ERP in Institutes majority of Technical Institutes are implemented EERP system which is 65.96 for the period of less than one year. The period of implementing EERP system is not more than three years looking at the data which has been collected.

5.1.2 Educational ERP modules

Table No 5.3: Educational ERP modules were implemented

Sr. No.	Modules	No. of respondents				Total	Rank
		Yes	%	No	%		
1	**Admin**	53	94.6	3	5.4	56	**1**
2	**Students**	53	94.6	3	5.4	56	**2**
3	**Admission**	50	89.3	6	10.7	56	**3**
4	**Library Management**	50	89.3	6	10.7	56	**4**
5	**Fee Collection**	45	80.4	11	19.6	56	**5**
6	**Staff**	44	78.6	12	21.4	56	**6**
7	**Placement**	34	60.7	22	39.3	56	**7**
8	**Alumni**	31	55.4	25	44.6	56	**8**
9	**Examination**	28	50.0	28	50	56	**9**
10	**Payroll Management**	23	41.1	33	58.9	56	**10**
11	**Utilities**	22	39.3	34	60.7	56	**11**
12	**Feedback / Suggestion Mechanism**	21	37.5	35	62.5	56	**12**
13	**Quiz**	21	37.5	35	62.5	56	**13**
14	**Knowledge Management**	20	35.7	36	64.3	56	**14**
15	**Result Processing**	19	33.9	37	66.1	56	**15**
16	**Result Analysis**	16	28.6	40	71.4	56	**16**
17	**HR Management**	16	28.6	40	71.4	56	**17**
18	**Financial Accounting**	16	28.6	40	71.4	56	**18**
19	**Organization**	15	26.8	41	73.2	56	**19**
20	**Parents**	14	25.0	42	75	56	**20**
21	**Transport Facilities**	10	17.9	46	82.1	56	**21**
22	**Hostel**	9	16.1	47	83.9	56	**22**
23	**Research and Consultancy**	7	12.5	49	87.5	56	**23**
24	**Asset Management**	5	9.1	51	8.9	56	**24**
25	**Transport**	3	5.4	53	94.6	56	**25**

Table No. 5.3 shows the different EERP system modules implemented by organization and their ranking according to organization point of view. It shows that out of 56 respondents' 94.6 percent organization makes usage of admin and students module followed by 89.3 percent respondents make use of admission and library management modules. Further 80.4 percent respondents make use of Fee Collection module**,** 78.6 percent respondents make use of staff module, 60.7 percent respondents make use of placement module and 55.4 percent respondents make use of alumni module followed by 50.0 percent respondents make use of examination. The least response for making use is transport module which is 5.4 percent.

According to responses from organization about EERP system and their rank, utilization of EERP modules the rank for admin **module** is given **One** and

followed by rank **Second student**. The least priority is given to the module transport at rank **Twenty-fifth.**

Summary:

The majority of the respondents have implemented Educational ERP modules are Admin, Students, Admission, Library Management, Fee Collection, Staff, Placement, Alumni and Examination which has more than 50 percent Institutes respondents. It has been seen that majority of the modules have not been utilized and implemented by Institutes which may cause to get the compliance reports / MIS reports to take any decision.

5.1.3 Training provided by Management to Staff and Learners

5.1.3.1 Training Provided by Management

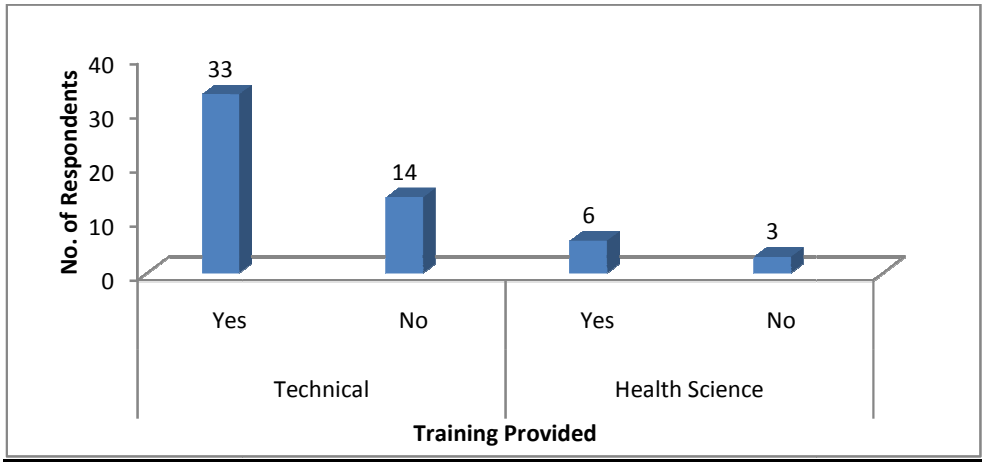
Table No 5.4: Training provided for educational ERP

Sr. No.	Training	No. of respondents				Total
		Technical		Health Science		
		Yes	No	Yes	No	
1	Does management provide training	33 (70.21)	14 (29.79)	6 (66.67)	3 (33.33)	**56**

Figures in bracket indicates Percentages

Table No. 5.4 shows the collection of Data from 56 respondents out of which 70.21 percent respondents get training provided by management and 29.79 percent respondents does not get training on Educational ERP to Technical Institutes. Whereas 66.67 percent respondents get training provided by management and 33.33 percent respondents does not get training on Educational ERP to Health Science Institutes.

Graph 5.2: Training provided for educational ERP



As can be observed from the Graph 5.2, 70.21 percent respondents provide training on EERP system to Technical Institutes and 66.67 percent respondents provide training on Educational ERP system to Health Science Institutes.

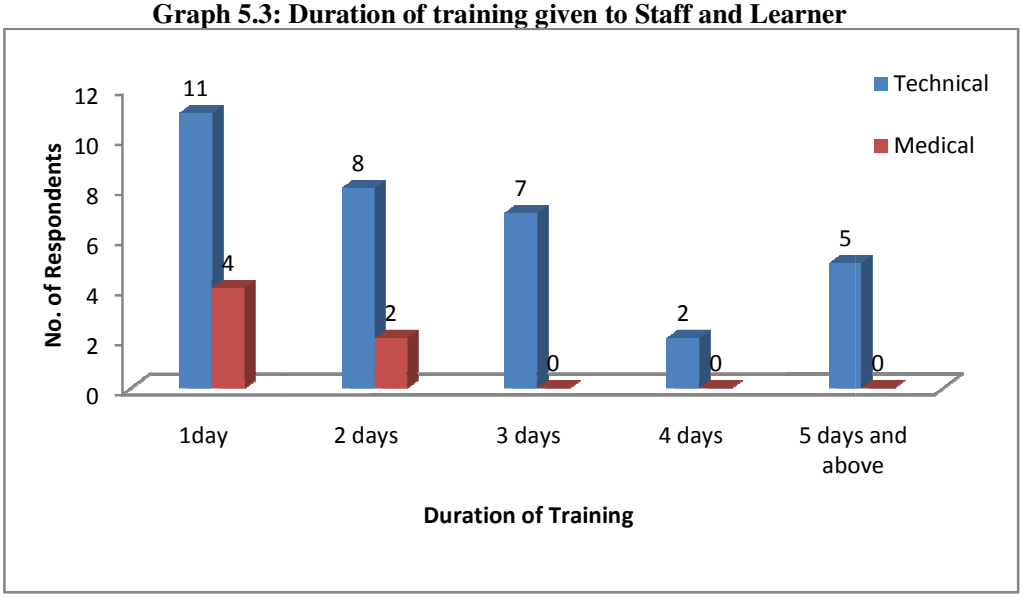
5.1.3.2 Duration of training provided Management to Staff and Learner

Table No 5.5: Duration of training given to Staff and Learner

Duration of training	No. of Respondents		Total
	Technical	Health Science	
1 day	11 (33.33)	4 (66.67)	15
2 days	8 (24.24)	2 (33.33)	10
3 days	7 (21.21)	0	7
4 days	2 (6.06)	0	2
5 days and above	5 (15.15)	0	5
Total	**33**	**6**	**39**

Table No. 5.5 shows out of 39 respondents from Technical and Health Science Institutes majority of respondents provided training to the staff and learners are for one day 33.33 percent respondents whereas 66.67 percent respondents provide training to Technical and Health Science respectively. Followed by 24.24 percent respondents and 33.33 percent respondents of Technical and Health Science respectively provide the training to the staff and learners for two days.21.21 percent respondents provide training to Technical Institutes for three days and 6.06 percent respondents provide training to Technical Institutes for Four days followed by 15.15 percent respondents provide training to Technical Institutes for Five days

Graph 5.3: Duration of training given to Staff and Learner



As can be observed from the Graph 5.3, 70.21 percent respondents provide training on EERP system to Technical Institutes and 66.67 percent respondents provide training on Educational ERP system to Health Science Institutes. The majority of Technical Institutes provide training on Educational ERP whereas Health Science Institutes does not provide training on Educational ERP.

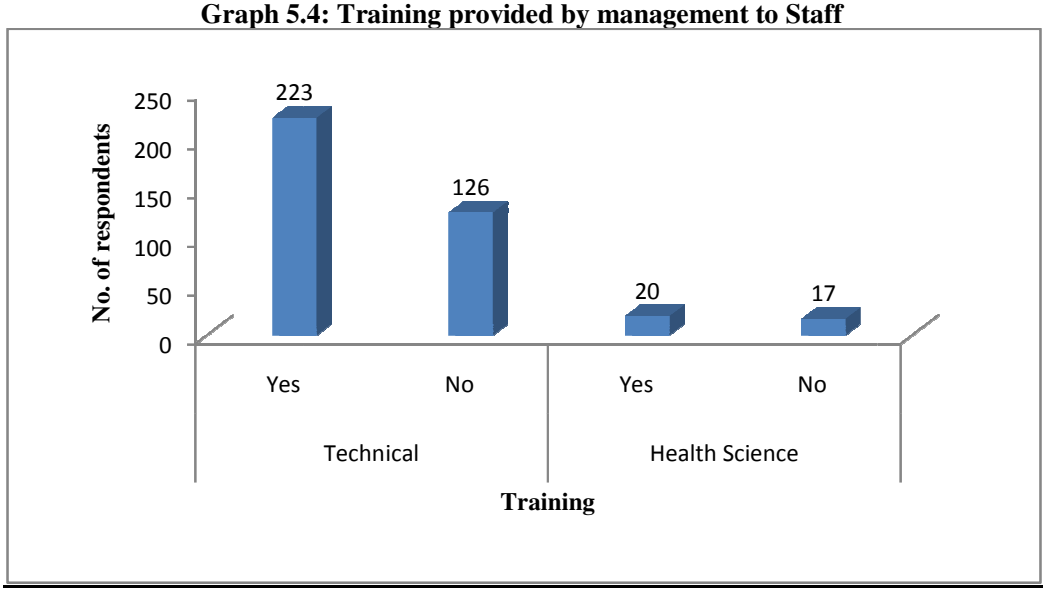
5.1.3.3 Training Provided to Staff

Table No. 5.6: Training provided by management to Staff

Sr. No.	Training	No. of respondents				Total
		Technical		Health Science		
		Yes	No	Yes	No	
1	Training provided to Staff	223 (63.90)	126 (36.10)	20 (54.05)	17 (45.95)	**386**

Table No. 5.6 represents collection of data from 386 respondents out of which 63.90 percent respondents get the training from management whereas 36.10 percent respondents don't get training from management in Technical Institutes. 54.05 percent respondents get training from management on EERP system whereas 45.95 percent respondents don't get training from management on EERP system in Health Science.

Graph 5.4: Training provided by management to Staff



As can be observed from the Graph 5.4, Implementation of EERP in Institutes the staff should get training on EERP system for smooth operation. 63.90 percent respondents get training on EERP system and 36.10 percent respondents don't get training on EERP system in Technical Institutes. Further 54.05 percent respondents get training on EERP system and 45.95 percent respondents don't get training on EERP system in Health Science.

5.1.3.4 Duration of training provided to Staff

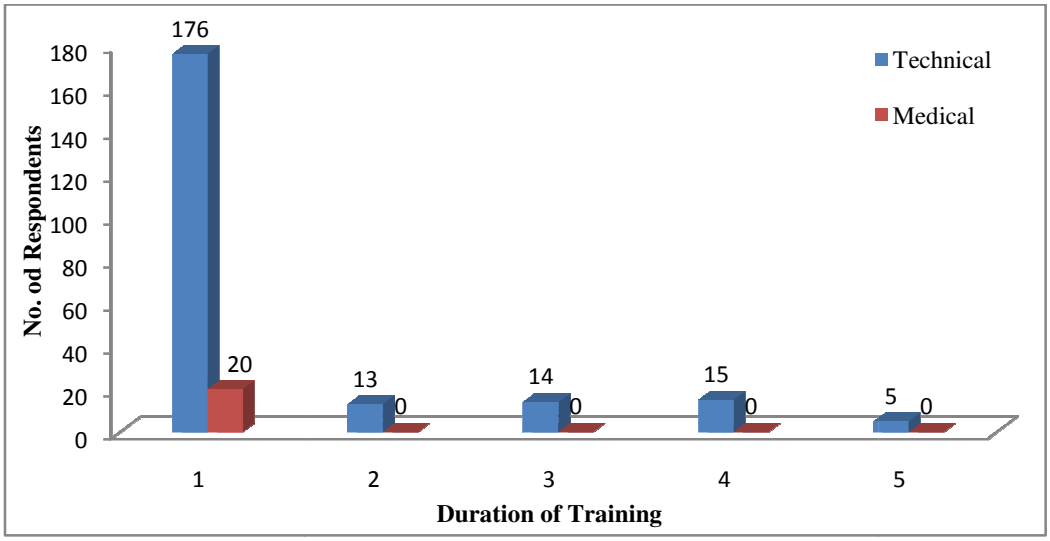
Table No 5.7: Duration of training given to the staff

Duration of training	No. of Respondents		Total
	Technical	Health Science	
1 day	176 (78.92)	20 (100)	196
2 days	13 (5.83)	0	13
3 days	14 (6.28)	0	14
4 days	15 (6.73)	0	15
5 days and above	5 (2.24)	0	5
Total	**223**	**20**	**243**

Table No. 5.7 shows out of 243 respondents from Technical and Health Science Institutes majority of respondents provided training to the staff for one day 78.92 percent respondents whereas 100 percent respondents provide training to Technical and Health Science respectively. Followed by 5.83

percent respondents get training for two days and 6.28 percent respondents get training for three days whereas 6.73 and 2.24 percent respondents get training to staff for four days and five days respectively.

Graph 5.5: Duration of training given to the staff



As can be observed from the Graph 5.5, the majority of respondents from Technical Institutes get training for more than one day whereas from Health Science Institutes does not get training more than one day for the staff.

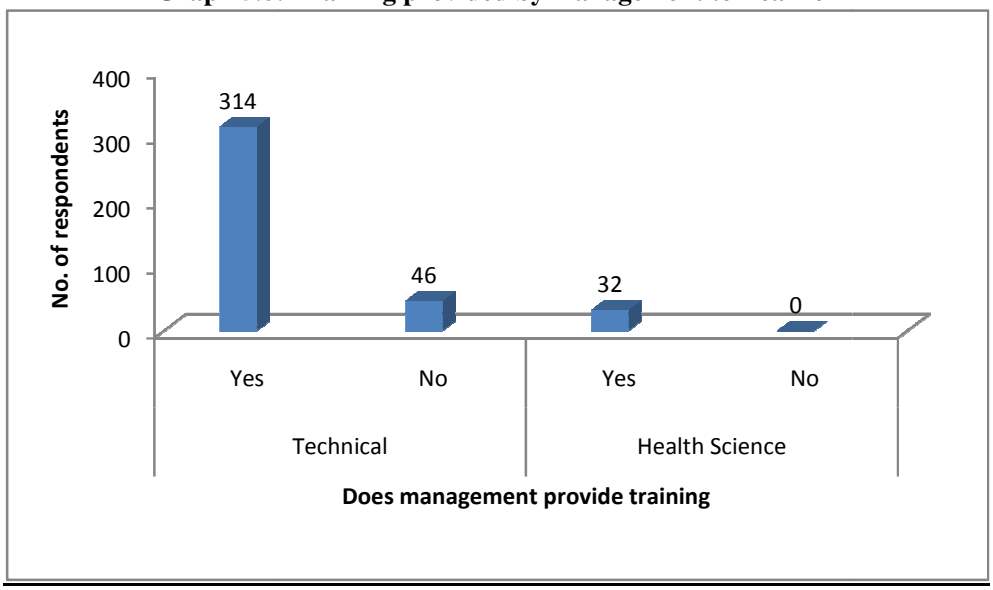
5.1.3.5 Training Provided to Learner

Table No. 5.8: Training provided by management to Learner

Sr. No.	Training	No. of respondents				Total
		Technical		Health Science		
		Yes	No	Yes	No	
1	Training provided to Learner	314 (87.22)	46 (12.78)	32 (100)	0	**392**

Table No. 5.8 represents collection of data from 392 respondents out of which 87.22 percent respondents get training from management to learners whereas 12.78 percent respondents don't get training from management to learners in Technical Institutes. 100 percent respondents get training from management on EERP system to learners of Health Science.

Graph 5.6: Training provided by management to Learner



As can be observed from the Graph 5.6, Implementation of EERP in Institutes the users should get training on EERP system for smooth operation.87.22 percent respondents get training on EERP system and 12.78 percent respondents don't get training on EERP system in Technical Institutes. Further 100 percent respondents get training on EERP system in Health Science Institutes learners.

5.1.3.6 Duration of training provided to Learner

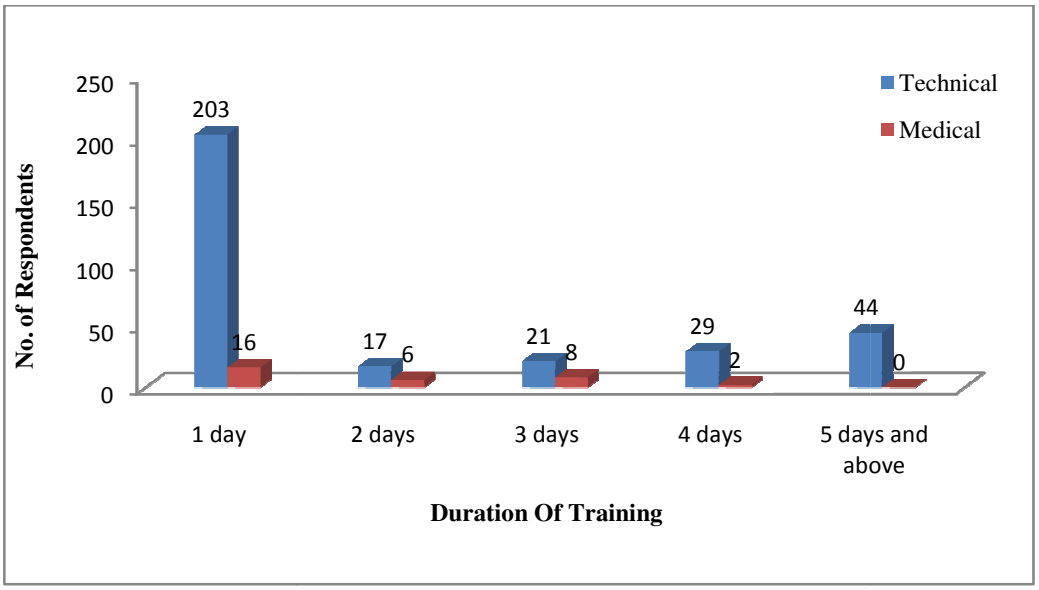
Table No 5.9: Duration of training given to Learner

Duration of training	No. of Respondents		Total
	Technical	Health Science	
1 day	203 (64.65)	16 (50.00)	219
2 days	17 (5.41)	6 (18.75)	23
3 days	21 (6.69)	8 (25.00)	29
4 days	29 (9.24)	2 (6.25)	31
5 days and above	44 (14.01)	0	44
Total	314	32	346

Table No. 5.9 shows out of 346 respondents from Technical and Health Science Institutes majority of respondents provided training to learner for one

day which is 64.65 and 50.00 percent for Technical and Health Science respectively. 5.41 percent respondents from Technical Institutes and 18.75 percent respondents from Health Science Learners get training for two days on Educational ERP system. 6.69 percent respondents from Technical Institutes and 25.00 percent respondents from Health Science Learners get training for three days on Educational ERP system. Followed by 9.24 percent respondents from Technical Institutes and 6.25 percent respondents from Health Science Learners get training for Four days on Educational ERP system.14.01 percent respondents from Technical Institutes learners get training for more than five days.

Graph 5.7: Duration of training given to the Learner



As can be observed from the Graph 5.7, the majority of respondents from Technical Institutes get training for more than one day whereas from Health Science Institutes does not get training more than five days for learner.

Summary

Training: Majority of the Technical and Health Science provide training to staff and Learners which is 70.21 percent and 66.67 percent respectively. Learners are more flexible than compare to Staff using Educational ERP system which is 63.90 percent and 54.05 percent for staff from Technical and Health Science Institutes and 87.22 percent and 100 percent for Learners from Technical and Health Science Institutes respectively.

Duration: Majority of the duration provided training to Staff and Learner on Educational ERP is not more than one day for Technical and Health Science Institutes which is above 50.00 percent. Whereas learners of Health Science Institutes acquire training on Educational ERP is more than one day which is 50.00 percent.

Therefore the training required on Educational ERP is more for Health Science Staff and Learners as Compare to Technical Institutes.

5.2 Present Problems in Educational ERP system

5.2.1 Factors influence the Management to implement EERP system

Table No. 5.10:Most important factors influence to implement EERP system

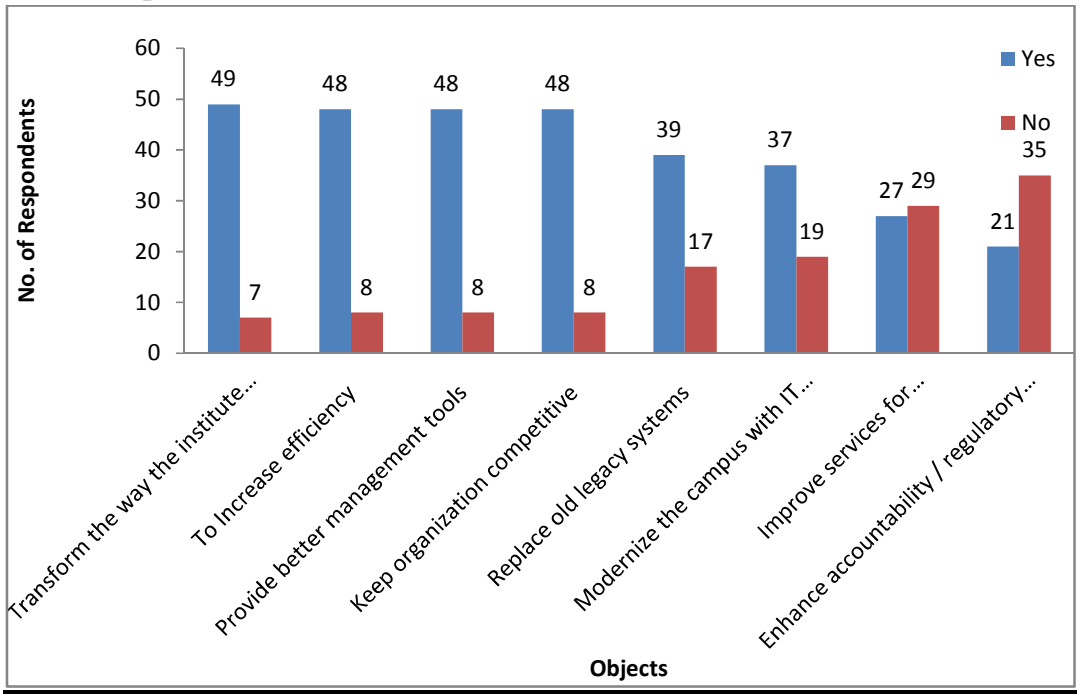
Sr. No.	Factors	No. of respondents				Total	Rank
		Yes	%	No	%		
1	**Transform the way the institute operates**	49	87.5	7	12.5	56	**1**
2	**To Increase efficiency**	48	85.7	8	14.3	56	**2**
3	**Provide better management tools**	48	85.7	8	14.3	56	**3**
4	**Keep organization competitive**	48	85.7	8	14.3	56	**4**
5	**Replace old legacy systems**	39	69.6	17	30.4	56	**5**
6	**Modernize the campus with IT environment**	37	66.1	19	33.9	56	**6**
7	**Improve services for management, faculties and students**	27	48.2	29	51.8	56	**7**
8	**Enhance accountability / regulatory compliance**	21	37.5	35	62.5	56	**8**

Table No. 5.10 shows the objectives for implementing EERP system in organization and their ranking according to organization point of view. It shows that out of 56 respondents 87.5 percent organization agreed that for objective as transform the way the institute operates followed by 85.7 percent organization respondent seek to increase efficiency and at the same level two more objectives fall at same i.e. 85.7 percent respondents for provide better management tools and keep organization competitive respectively. A further 69.6 percent seek to replace old legacy systems followed by 66.1 percent respondents to Modernize the campus with IT environment, 48.2 percent

respondents opt for Improve services for management, faculties and students and least priority given 37.5 percent respondents opt for Enhance accountability / regulatory compliance which gives an idea and importance given by organization for implementing EERP system.

According to organization importance of objectives for implementing EERP system, the first is for rank transform the way the institute operates followed by rank **second** to increase efficiency. The last rank is priority given to enhance accountability / regulatory compliance.

Graph 5.8: Most important factors influence to implement EERP system



The Graph 5.8 clearly indicates that, the objective has highest 87.5 percent respondents gives highest priority for objective Transform the way the institute operates followed by three more objectives has same 85.7 percent has same respondents for objective To Increase efficiency, Provide better management tools and Keep organization competitive. A further 69.6 percent respondent for the objective Replace old legacy systems followed by 66.1 percent respondent for Modernize the campus with IT environment. 48.2 percent respondents says Improve services for management, faculties and students followed by least priority given to the object is 37.5 percent say Enhance accountability / regulatory compliance. The response for objective

selected least priority given to Enhance accountability / regulatory compliance which states that management don't bother of getting compliance reports for AICTE, University, NBA and government offices.

Summary:

The majority of respondents from Technical and Health Science Institutes wants change in the organization with the factors that influence the management to implement Educational ERP are first factor is transform the way the Institutes Operates, second factor to increase efficiency, third factor provide better management tools and fourth factor keep organization competitive with above 85.7 percent from the respondents. The Factors which influence the change in the organization to implement Educational ERP are Replace old legacy systems (69.6 percent), Modernize the campus with IT environment (66.1 percent),Improve services for management, faculties and students (48.2 percent) and Enhance accountability / regulatory compliance (37.5 percent). The respondents implemented Educational ERP system depends on the factors which Board of Director / Management has chosen is based on the ranking.

5.2.2 Mode of communication

5.2.2.1 Mode of communication w.r.t. Management

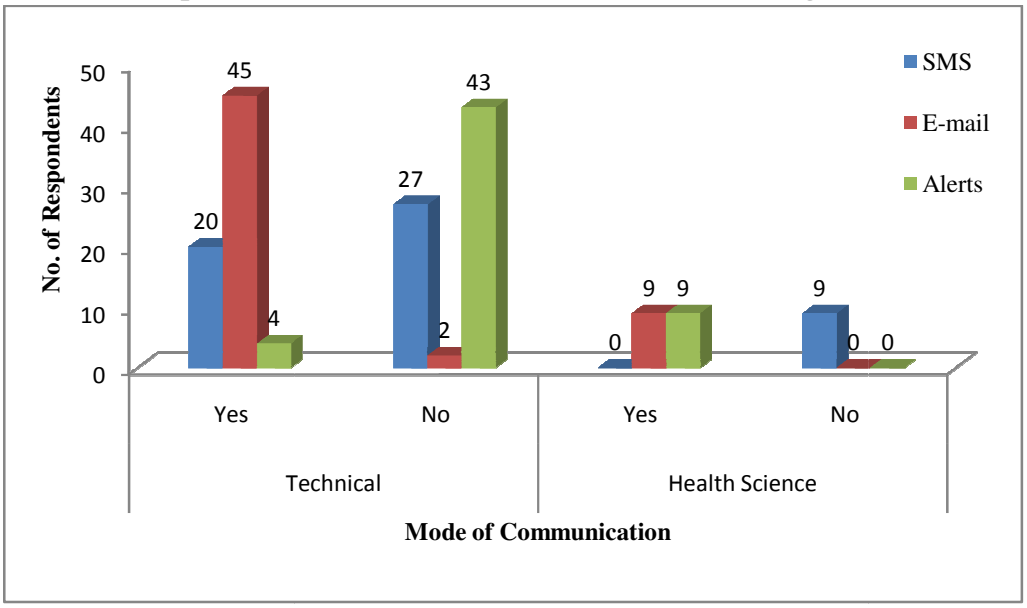
Table No. 5.11: EERP mode of communication for Management

Sr. No.	Mode of communication through EERP	No. of respondents				Total
		Technical		Health Science		
		Yes	No	Yes	No	
1	**SMS**	20 (42.55)	27 (57.45)	0	9 (100)	56
2	**E-mail**	45 (95.74)	2 (4.26)	9 (100)	0	56
3	**Alerts**	4 (8.51)	43 (91.49)	9 (100)	0	56

The **Table No. 5.11**, the collected data from 56 respondents out of which 95.74 percent respondents are satisfied with E-mail mode of communication with Technical category and 100 percent respondents are satisfied with E-mail mode of communication with Health Science Category whereas negligible respondents from both the category are satisfied with e-mail mode

of communication. Further 42.55 percent respondents are satisfied with SMS mode of communication from Technical Category and negligible (0%) respondents are satisfied with SMS mode of communication with Health Science category. Further 8.51 percent respondents satisfied with alert message with Technical category and 100 percent respondents with Health Science category.

Graph 5.9: EERP mode of communication for Management



The Graph 5.9 shows the representation of providing various mode of communication in Educational ERP system. It provides SMS, E-mail and Alert mode of communication through EERP which will help to interact with users. Researcher has collected. Researcher has collected data from 49 Technical Institutes and 9 Health science Medical Institutes. Most of the institutes prefer to make use of e-mail mode of communication which is 95.74 percent Technical and 100 percent Health Science category. Further 42.55 percent use SMS mode of communication in Technical Institutes and negligible (0%) for Health Science Institutes. It is followed by alert messages 8.51 percent make use of alert messages for communication for technical Institutes and 100 percent respondents from Health Science make use of alert message.

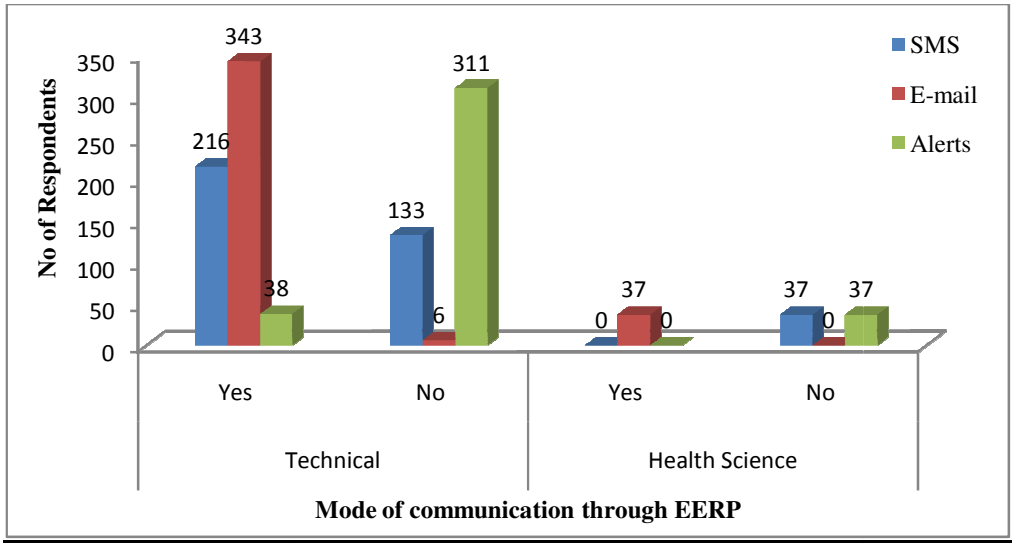
5.2.2.2 Mode of communication w.r.t. staff

Table No. 5.12: EERP mode of communication for Staff

Sr. No.	Mode of communication through EERP	No. of respondents				Total
		Technical		Health Science		
		Yes	No	Yes	No	
1	**SMS**	216 (61.89)	133 (38.11)	0	37 (100)	386
2	**E-mail**	343 (98.28)	6 (1.72)	37 (100)	0	386
3	**Alerts**	38 (10.89)	311 (89.11)	0	37 (100)	386

The **Table No. 5.12** represents the distribution of respondents according to the Mode of communication like SMS, E-mail and Alerts. The data collected from 386 respondents out of which 98.28percent respondents are satisfied with E-mail mode of communication with Technical category and 100 percent respondents are satisfied with E-mail mode of communication with Health Science Category whereas negligible respondents from both the category are satisfied with e-mail mode of communication. Further 61.89 percent respondents are satisfied with SMS mode of communication from Technical Category and negligible (0%) respondents are satisfied with SMS mode of communication with Health Science category. Further 10.89 percent respondents are satisfied with alert message with Technical category and negligible (0%) respondents with Health Science category.

Graph 5.10: EERP mode of communication for Staff



As can be seen in Graph 5.10, it is apparent that most of the respondents are making use of E-mail as mode of communication with Technical and Health Science Institutes, whereas negligible percent of respondents make use of Alert and SMS as mode of Communication.

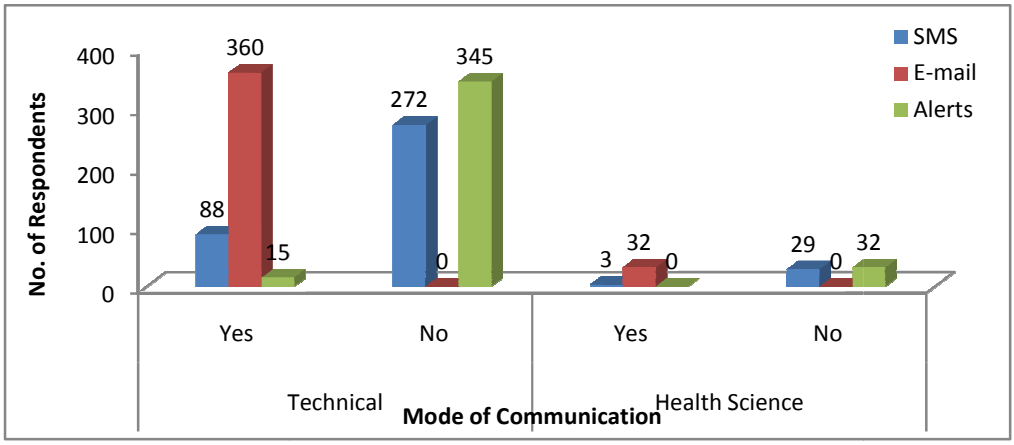
5.2.2.3 Mode of communication w.r.t. Learner

Table No. 5.13: EERP mode of communication for Learner

Sr. No.	Mode of communication through EERP	No. of respondents				Total
		Technical		Health Science		
		Yes	No	Yes	No	
1	**SMS**	88 (24.44)	272 (75.56)	3 (9.38)	29 (90.63)	392
2	**E-mail**	360 (100)	0	32 (100)	0	392
3	**Alerts**	15 (4.17)	345 (95.83)	0	32 (100)	392

The Table No. 5.13 represents the distribution of respondents according to the Mode of communication like SMS, E-mail and Alerts. The data collected from 386 respondents out of which 100 percent respondents are satisfied with E-mail mode of communication with Technical category and 100 percent respondents are satisfied with E-mail mode of communication with Health Science Category whereas negligible respondents from both the category are satisfied with e-mail mode of communication. Further 24.44 percent respondents are satisfied with SMS mode of communication from Technical Category and 9.38 percent respondents are satisfied with SMS mode of communication with Health Science category. Further 4.17 percent respondents are satisfied with alert message with Technical category and negligible (0%) respondents with Health Science category.

Graph 5.11: EERP mode of communication for Learner



As can be seen in Graph 5.11, it is apparent that most of the respondents are making use of E-mail as mode of communication with Technical and Health Science Institutes, whereas negligible percent of respondents make use of Alert and SMS as mode of Communication.

Summary:

The majority of respondents from Technical and Health Science Institutes make use of Mode of communication as E-mail which is more than 95.00 percent response from the Board of Director / Management, Staff and Learner whereas only few respondents make use of SMS and Alert as mode of communication.

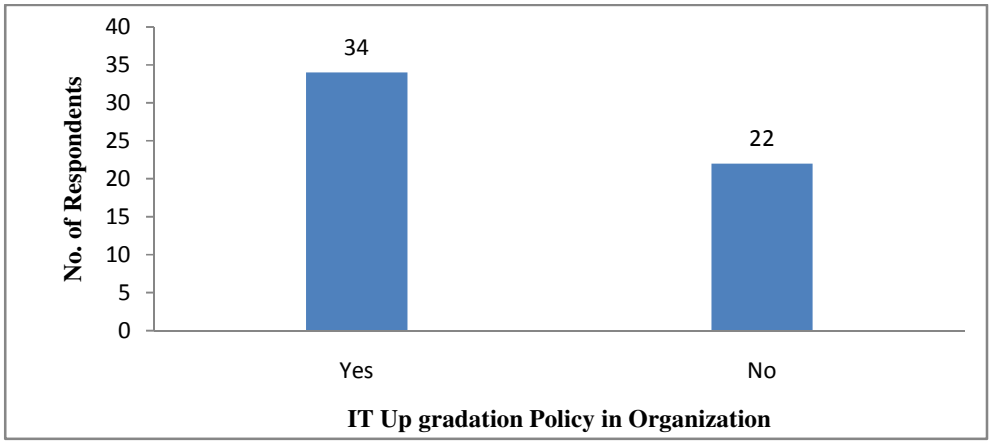
5.2.3. IT up gradation policy

Table No. 5.14: IT up gradation policy in organization

Sr. No.	IT upgrade Policy	No. of respondents				Total
		Yes	%	No	%	
1	IT Up gradation Policy in Organization	34	60.7	22	39.3	56

The **Table no. 5.14** shows the distribution of IT up gradation policy of organization. IT up gradation policy will help organizations to upgrade the existing system / hardware configuration. This will keep organization to increase efficiency, provide better management tools, improve services for users and modernize the campus with IT environment. It is seen that most of the organizations have IT up gradation policy for Infrastructure. 60.70 Percent organization have IT up gradation policy in organization followed by 39.3 percent organization have not been implemented in the organization.

Graph 5.12:IT up gradation policy in your organization



As can be observed from the Graph 5.12, most of the respondents have IT up-gradation policy in organization. Around 60.7 percent respondents have IT up gradation policy in place and 39.3 percent respondents have not set IT up gradation policy in place. Therefore the organization which don't have policy they take decision as on when they required to make changes, which will take more time to come back with solutions.

Summary:

The majority of respondents from Technical and Health Science Institutes have IT up gradation policy which is more than 60.7 percent which will help the Institutes to upgrade or adopt new functionalities in Educational ERP as per upcoming Technology.

5.2.4. Security

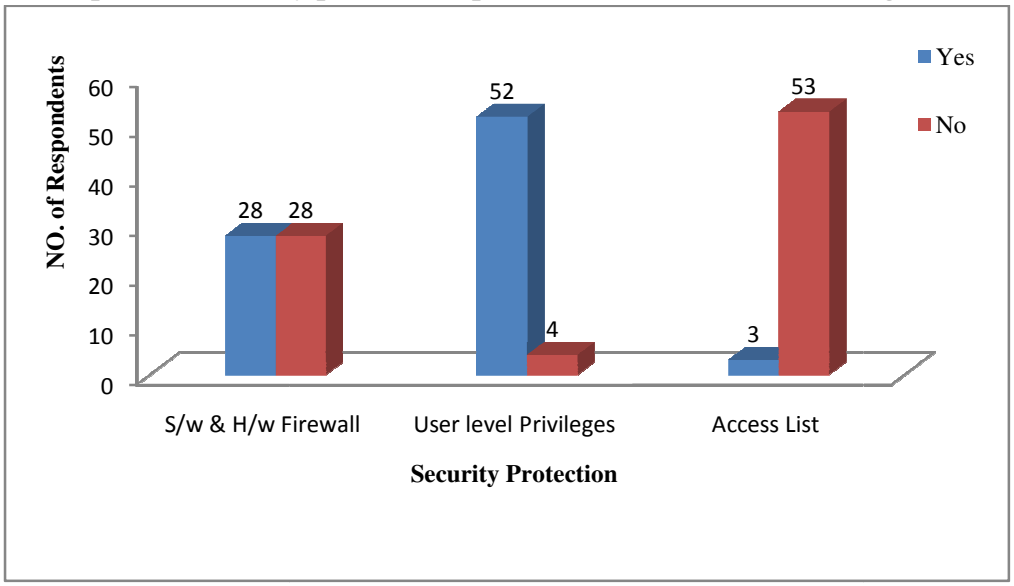
5.2.4.1 Provided Security w.r.t. Management

Table No: 5.15: Security provided to protect Information from Management

Sr. No.	Security Protection	No. of respondents				Total
		Yes	%	No	%	
1	S/w & H/w Firewall	28	50.0	28	50.0	56
2	User level Privileges	52	92.9	4	7.1	56
3	Access List	3	5.4	53	94.6	56

Table No 5.15 represents 50.0 percent respondents have answered in affirmative whereas 50.0 percent respondents have answered in negative for implementing security protection as S/w & H/w Firewall in EERP system, majority of organization i.e. 92.9 percent implemented EERP system has security protection as User level Privileges and negligible organization has implemented Access list as security protection.

Graph 5.13: Security provided to protect Information from Management



The Graph 5.13 clearly indicates most of the respondents i.e. 92.9 percent user level privileges go for the security protection. Further 50.0 percent respondents opt for S/W and H/W firewall. The response for access list is very low as compare to other security protection.

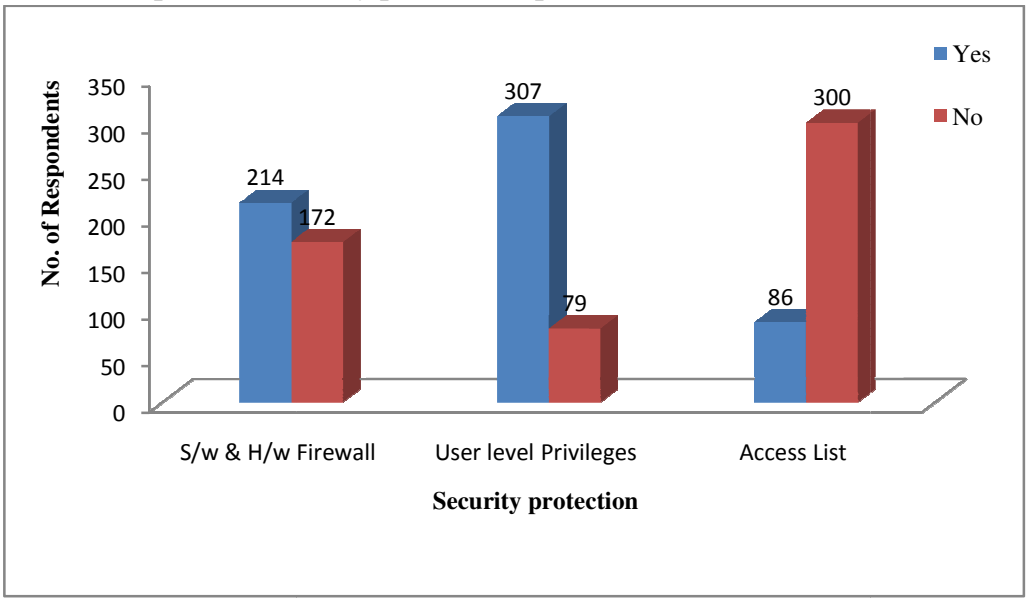
5.2.4.2 Provided Security w.r.t. staff

Table No: 5.16: Security provided to protect Information from staff

Sr. No.	Security Protection	No. of respondents				Total
		Yes	%	No	%	
1	S/w & H/w Firewall	214	55.4	172	44.6	386
2	User level Privileges	307	79.5	79	20.5	386
3	Access List	86	22.3	300	77.7	386

As per table no 4, 55.4 percent respondents have answered in affirmative whereas 44.6 percent respondents have answered in negative for implementing security protection as S/w & H/w Firewall in EERP system, majority of organization implemented EERP system has security protection as User level Privileges i.e 79.5 percent respondents and 22.3 percent organization has implemented Access list as security protection.

Graph 5.14: Security provided to protect Information from staff



The Graph 5.14 clearly indicates most of the respondents go for the security protection which is user level privileges which is 79.5 percent. Further 55.4 percent respondents opt for S/W and H/W firewall. The response for access list is very low as compare to other security protection which is 22.3 percent.

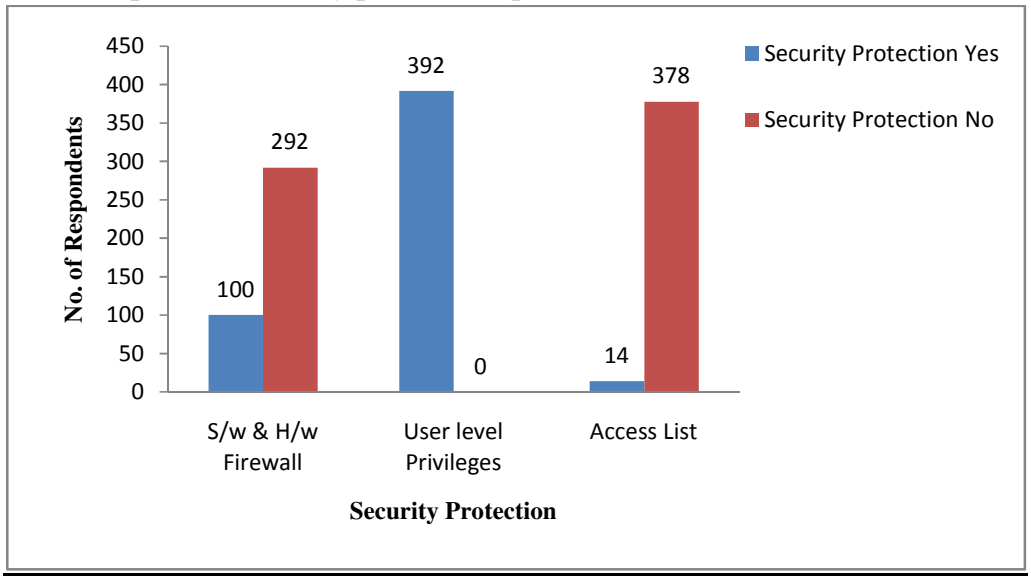
5.2.4.3 Security provided w.r.t. Learner

Table No: 5.17: Security provided to protect Information from Learner

Sr. No.	Security Protection	No. of respondents				Total
		Yes	%	No	%	
1	S/w & H/w Firewall	100	25.5	292	74.5	392
2	User level Privileges	392	100.0	0	0.0	392
3	Access List	14	3.6	378	96.4	392

As per Table No. 5.17, 74.5 percent respondents have answered in affirmative whereas 25.5 percent respondents have answered in negative for implementing security protection as S/w & H/w Firewall in EERP system, majority of organization implemented EERP system has security protection as User level Privileges i.e 100.0 percent respondents and negligible i.e. 3.6 percent organization has implemented Access list as security protection.

Graph 5.15: Security provided to protect Information from Learner



The Graph 5.15 clearly indicates most of the respondents go for the security protection which is user level privileges which is 100.0 percent. Further 25.5 percent respondents opt for S/W and H/W firewall. The response for access list is very low as compare to other security protection which is 3.6 percent.

Summary:

The security provide to Technical and Health science Institutes with Educational ERP system is user level privileges which is above 79.2 percent as compare to other security like S/w and H/w Firewall (55.4 percent) and Access list (22.4 percent).

5.2.5 Vendors Recovery Action

5.2.5.1 Vendors' recovery action w.r.t. management

Table No 5.18: vendors' recovery action (Problem Solving Capabilities) from Management

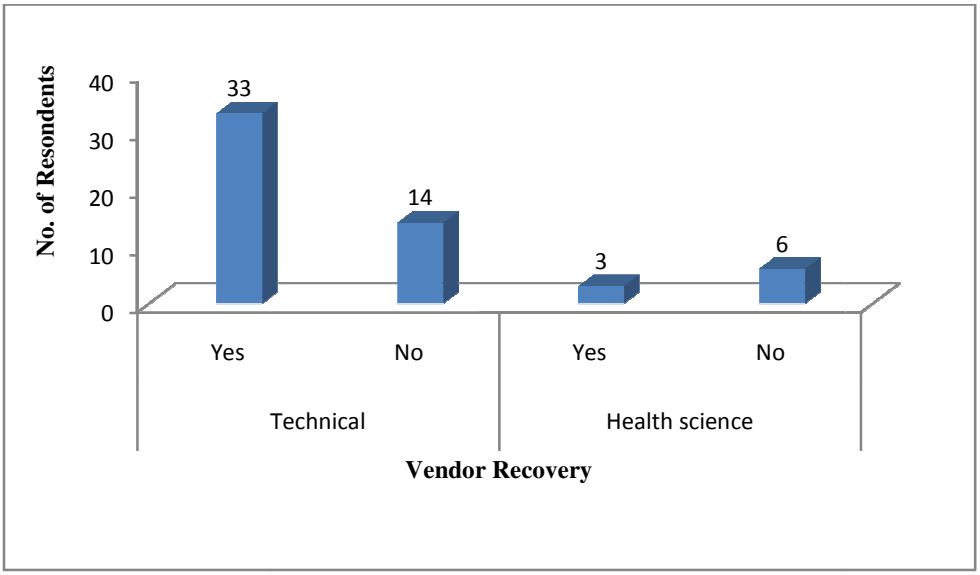
Sr. No.	Vendors Recovery	No. of respondents				Total
		Technical		Health science		
		Yes	No	Yes	No	
1	Satisfied from the vendors recovery action	33 (70.21)	14 (29.79)	3 (33.33)	6 (66.67)	56

Figures in bracket indicates Percentages

Table No. 5.18 shows the representation of data collected from 56 respondents out of which 70.21 percent respondents are satisfied with the vendors recovery action with Technical Institutes whereas 33.33 percent

respondents from Health Science are satisfied with the vendors recovery action. Further 29.79 percent respondents are not satisfied with the vendors recovery action with Technical Institutes and 66.67 percent respondents are not satisfied with the vendors recovery action with Health Science Institutes.

Graph 5.16: **vendors' recovery action (Problem Solving Capabilities) from management**



As can be observed from the Graph 5.16, most of the organization from Technical Institutes have vendor recovery action plan as compare to the Health Science Institutes.

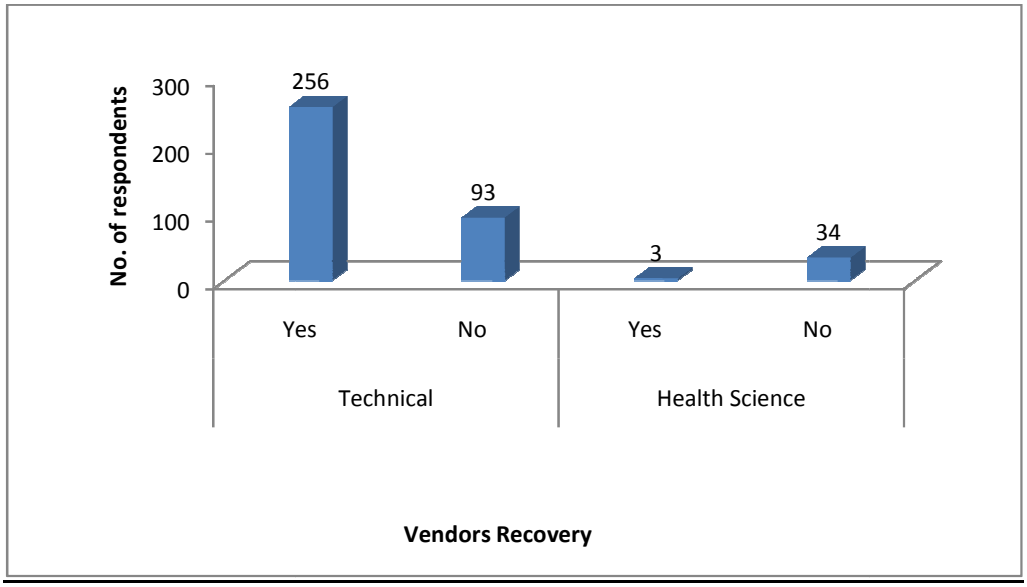
5.2.5.2 Vendors' recovery action w.r.t. staff

Table No 5.19: vendors' recovery action (Problem Solving Capabilities) from staff

Sr. No.	Vendors Recovery	No. of respondents				Total
		Technical		Health Science		
		Yes	No	Yes	No	
1	Satisfied from the vendors recovery action	256 (73.35)	93 (26.65)	3 (8.11)	34 (91.89)	386

Table No. 5.19 shows the distribution of data collected from 386 respondents out of which 73.35 percent respondents are satisfied with the vendor recovery action and 26.65 percent respondents are not satisfied with the vendor recovery action. Further only negligible i.e. 8.11percent respondents are satisfied with the vendor recovery action and 91.89 percent respondents are not satisfied with the vendor recovery action.

Graph 5.17: vendors' recovery action (Problem Solving Capabilities) from staff



As can be observed from the Graph 5.17, most of the organization from Technical Institutes have vendor recovery action plan as compare to the Health Science Institutes. Further respondents should take follow up of management to talk with vendors to solve EERP system problem.

5.2.5.3 Vendors' recovery action w.r.t. learner

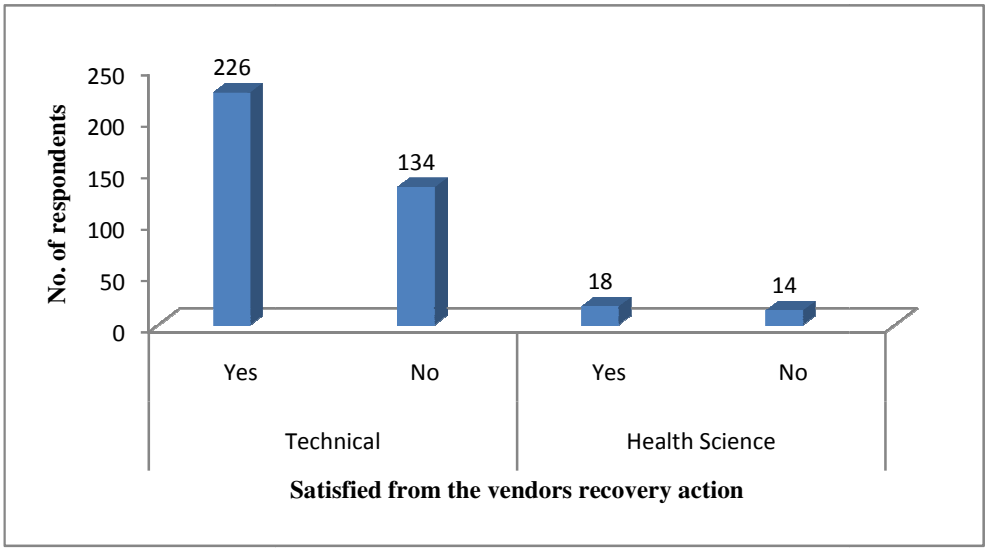
Table No 5.20: vendors' recovery action (Problem Solving Capabilities) from Learner

Sr. No.	Vendors Recovery	No. of respondents				Total
		Technical		Health Science		
		Yes	No	Yes	No	
1	Satisfied from the vendors recovery action	226 (62.78)	134 (37.22)	18 (56.25)	14 (43.75)	392

Figures in bracket indicates Percentages

Table No. 5.20 shows the distribution of data collected from 392 respondents out of which 62.78 percent respondents are satisfied with the vendor recovery action and 37.22 percent respondents are not satisfied with the vendor recovery action. Further 56.25 percent respondents are satisfied with the vendor recovery action and 43.75 percent respondents are not satisfied with the vendor recovery action.

Graph 5.18: vendors' recovery action (Problem Solving Capabilities) from Learner



As can be observed from the Graph 5.18, most of the organization from Technical and Health Science Institutes have vendor recovery action plan. The respondents dissatisfied with vendor recovery action have to take follow up of management to talk with vendors to solve EERP system problem.

Summary:

Most of the Technical Institutes are satisfied with the recovery action taken from vendors which is 70.21 percent as compare to the Health Science Institutes is 33.33 percent. The recovery action provided from management to staff and Learners as compare to Health Science is more for Technical Institutes. Therefore the problem solving capacity from vendors should be provided to Health Science Institutes and make aware of the Educational ERP system.

5.2.6 Duration of Solving problem / Bug

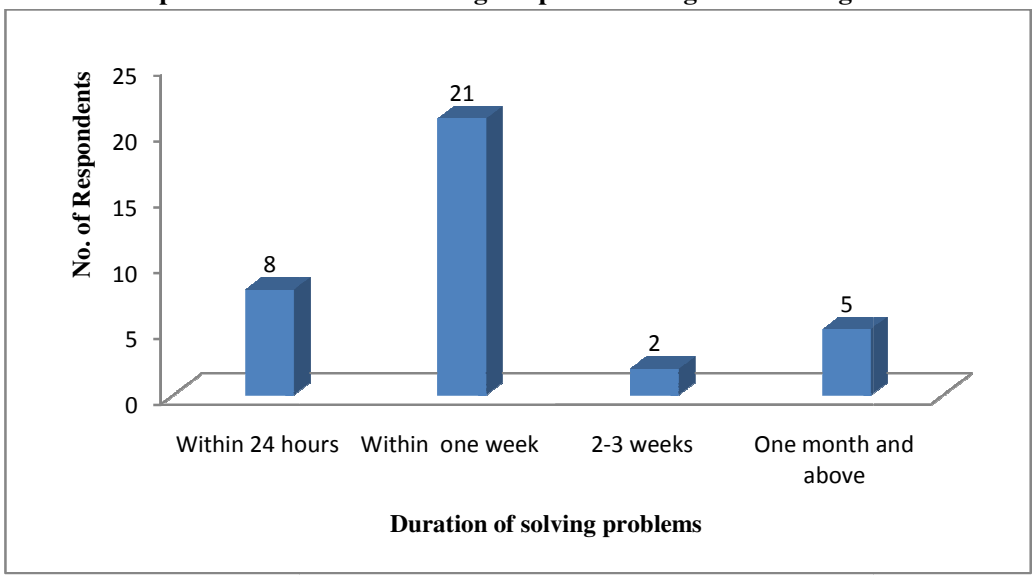
5.2.6.1 Duration of solving the problem/ bug w.r.t. Managemant

Table No 5.21: Duration of solving the problem/ bug from Management

Duration of Solving problem/ bug	No. of Respondents	Percent
Within 24 hours	8	22.2
Within one week	21	58.3
2-3 weeks	2	5.6
One month and above	5	13.9
Total	**36**	**100.0**

Table No. 5.21 shows out of 36 respondent's duration required for solving the problems by vendors. 22.2 percent respondents agreed that within 24 hours problem has been resolved followed by 58.3 percent respondents agreed that vendors takes one week to resolve issues only few i.e. 5.6 percent respondents agreed that vendors takes 2 to 3 weeks followed by 13.9 percent respondents point of view vendors takes long time i.e. one month or more than that to resolve same issue.

Graph 5.19: Duration of solving the problem/ bug from Management



The Graph 5.19 clearly indicates about responses from the satisfied about vendors' recovery action and the duration of resolving problems. The responses indicate that 58.3 percent problems are solved within one week followed by 22.2 percent respondents agreed within 24 hours. Further 13.9

percent respondents get solution for the problem after one month and above followed by 5.6 percent respondents get solution 2-3 week.

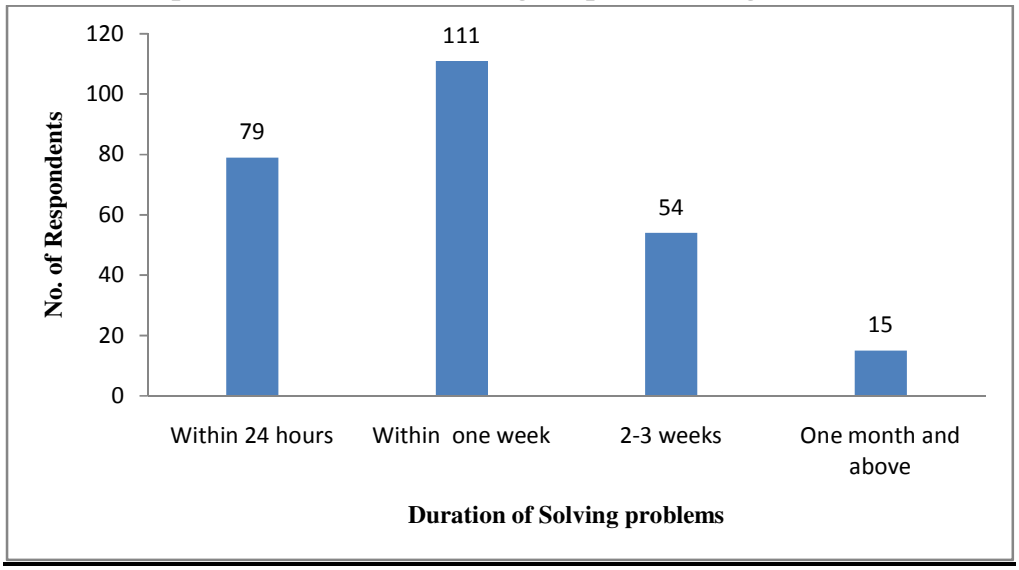
5.2.6.2 Duration of solving the problem/ bug w.r.t Staff

Table No 5.22:Duration of solving the problem/ bug from Staff

Duration of Solving problem/ bug	No. of Respondents	Percent
Within 24 hours	79	30.5
Within one week	111	42.9
2-3 weeks	54	20.8
One month and above	15	5.8
Total	**259**	**100.0**

Table No. 5.22 shows out of 259 respondent's duration of solving the problems by vendors. 30.5 percent respondents say within 24 hours followed by 42.9 percent respondents which are more than other duration of solving problem within one week. 20.8 percent respondents answered 2-3 weeks, followed by 5.8 percent respondents says one month and above.

Graph 5.20: Duration of solving the problem/ bug from Staff



The Graph 5.20 clearly indicates about response from the satisfied from vendors' recovery action and the duration of solving problems. The responses indicate that 42.9 percent problems are solved within one week followed by 30.5 percent respondents within 24 hours. Further 20.8 percent respondents

get solution for the problem 2-3 weeks followed by 5.8 percent respondents get solution after one month and above.

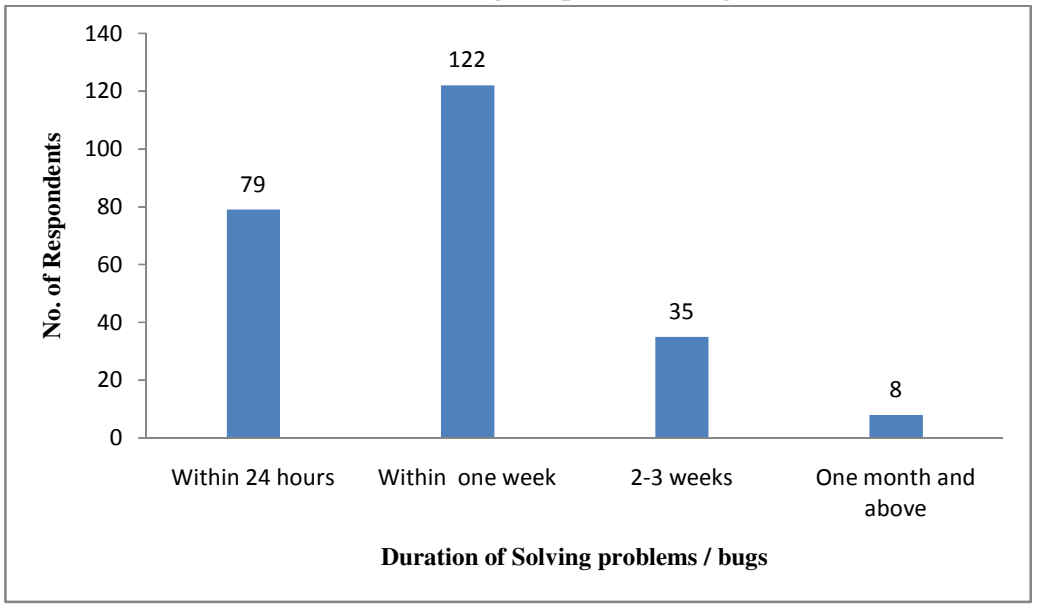
5.2.6.3 Duration of solving the problem/ bug w. r. t. learner

Table No 5.23: Duration of solving the problem/ bug from Learners

Duration of Solving problem/ bug	No. of Respondents	Percent
Within 24 hours	79	32.38
Within one week	122	50.00
2-3 weeks	35	14.34
One month and above	8	3.28
Total	**244**	**100.0**

Table No. 5.23 shows out of 244 respondent's duration of solving the problems by vendors. 32.38 percent respondents say within 24 hours followed by 50.0 percent respondents which are more than other duration of solving problem within one week. 14.34 percent respondents answered 2-3 weeks, followed by 3.28 percent respondents says one month and above.

Graph 5.21:Duration of solving the problem/ bug from Learner



The Graph 5.21 clearly indicates about response from the satisfied from vendors' recovery action and the duration of solving problems. The responses indicate that 50.00 percent problems are solved within one week followed by 32.38 percent respondents within 24 hours. Further 14.34 percent respondents

get solution for the problem 2-3 weeks followed by 3.28 percent respondents get solution after one month and above.

Summary:

Least number of respondents is satisfied from Technical and Health Science Institutes duration of solving the problems of Educational ERP is with 24 hours from vendors for management is 22.2 percent, Staff is 30.5 percent and Learners is 32.38 percent. Whereas more number of respondents get solved the problems from vendors is within one week. Overall the Management, Staff and Learner are not satisfied with solving the problems are above 17.00 percent which is 2-3 weeks and above one month.

5.2.7 Feedback

5.2.7.1 Feedback of Educational ERP w.r.t. Staff

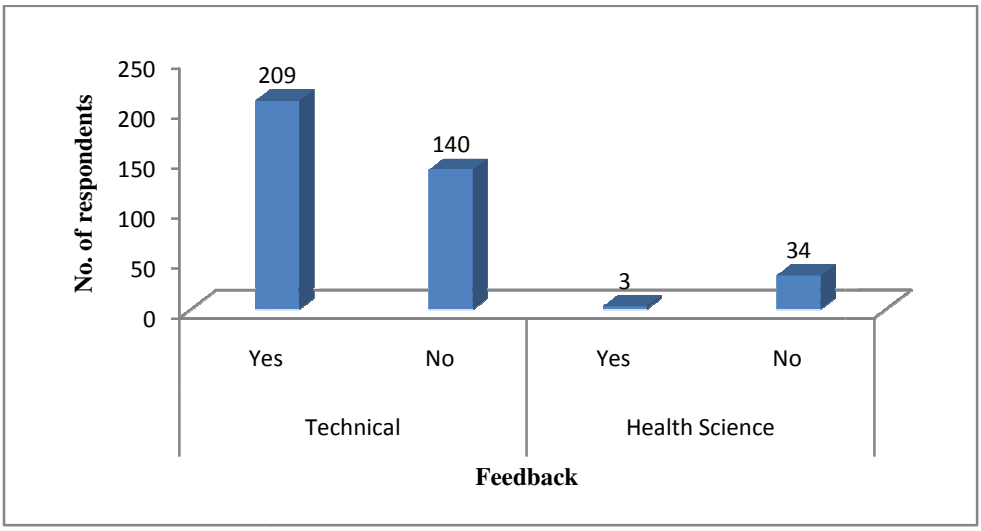
Table No.5.24:Feedback of Educational ERP from Staff

Sr. No.	Feedback	No. of respondents				Total
		Technical		Health Science		
		Yes	No	Yes	No	
1	Does management takes feedback	209 (59.89)	140 (40.11)	3 (8.11)	34 (91.89)	386

Figures in bracket indicates Percentages

Table No. 5.24 shows the distribution of data collected from 386 respondents out of which 59.89 percent respondents say that management take feedback of EERP system and 40.11 respondents say that the management don't take feedback on EERP system in Technical Institutes. Further only 8.11 percent respondents are satisfied about taking feedback on EERP system and 91.89 percent respondents are not satisfied with the management about feedback on EERP system in Health Science Institutes.

Graph 5.22: Feedback of Educational ERP from Staff



As can be observed from the Graph 5.22 majority of Technical Institutes take feedback of staff for improvement whereas for Health Science Institutes the management is least bother of taking feedback from staff. Feedback will help management to clarify the doubt from the staff.

5.2.7.2 Feedback of Educational ERP w.r.t. learner

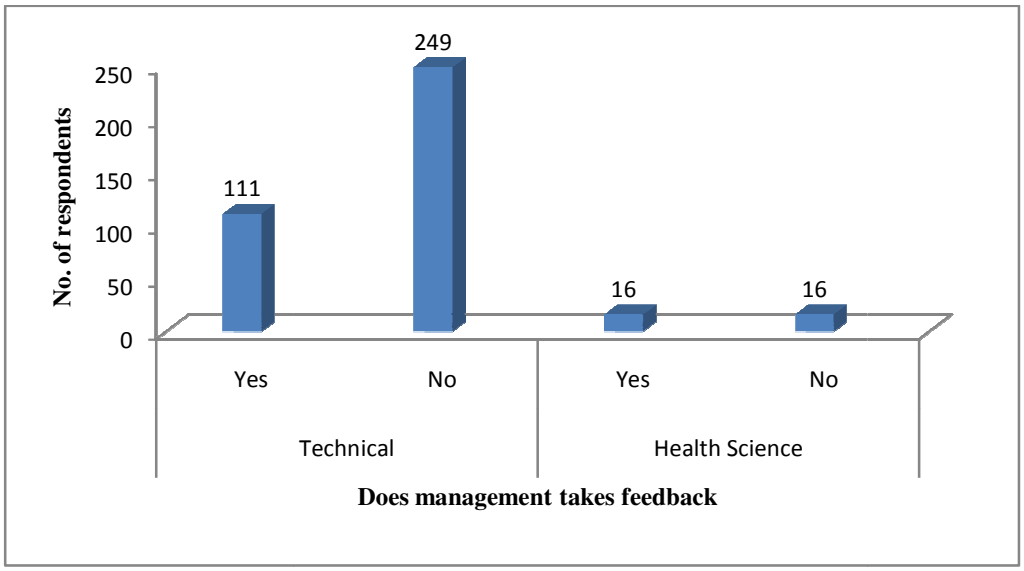
Table No. 5.25: Feedback of Educational ERP from Learner

Sr. No.	Feedback	No. of respondents				Total
		Technical		Health Science		
		Yes	No	Yes	No	
1	Does management takes feedback	111 (30.83)	249 (69.17)	16 (50.00)	16 (50.00)	392

Figures in bracket indicates Percentages

Table no. 5.25 shows the distribution of data collected from 392 respondents out of which 30.83 percent respondents say that management take feedback of EERP system and 69.17 percent respondents say that the management don't take feedback on EERP system in Technical Institutes. Further 50.00 percent respondents are satisfied about taking feedback on EERP system and 50.00 percent respondents are not satisfied with the management about feedback on EERP system in Health Science Institutes.

Graph 5.23: Feedback of Educational ERP from Learner



As can be observed from the Graph 5.23, the learners from Health Science feedback taken is 50.00 percent whereas 30.83 percent learners from Technical Institutes feedback is taken for the betterment of usage of Educational ERP system.

Summary:

Majority of Technical Institutes which is 59.89 percent respondents feedback is taken as compare to Health Science Institutes only 40.11 percent respondents feedback has taken by Board of Director / Management. Whereas from learners perspective 69.17 percent respondents feedback is taken as compare to Health Science Institutes which 50.00 percent feedback is taken by board of Director / Management.

5.2.8 Frequency of Feedback

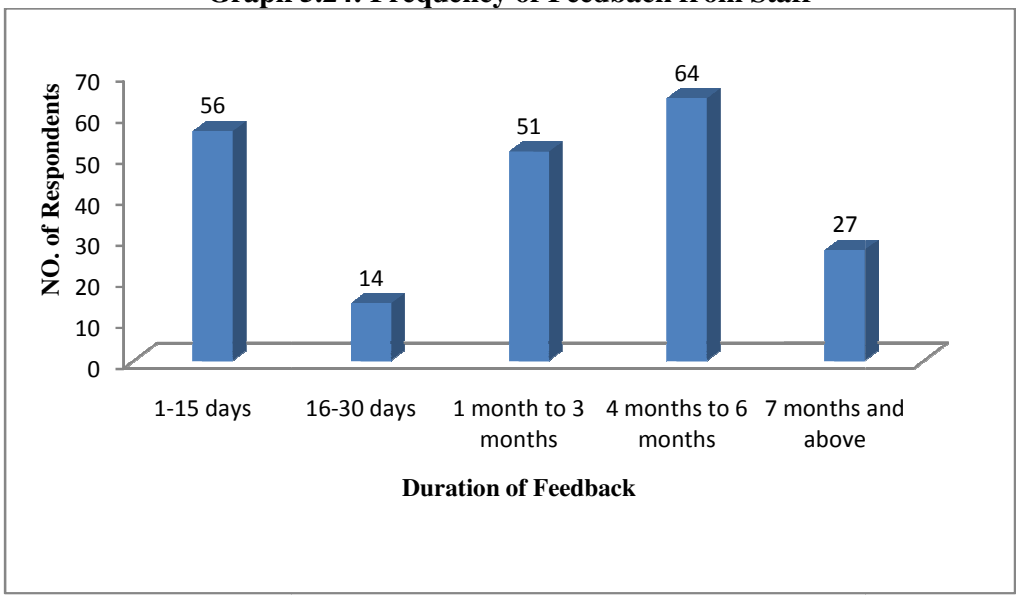
5.2.8.1 Frequency of Feedback w.r.t. satff

Table No 5.26: Frequency of Feedback from Staff

Duration of Feedback	No. of Respondents	Percent
1-15 days	56	26.4
16-30 days	14	6.6
1 month to 3 months	51	24.1
4 months to 6 months	64	30.2
7 months and above	27	12.7
Total	**212**	**100.0**

Table No. 5.26 shows out of 212 respondent's duration of feedback taken by management for 1-15 days is 26.4 percent and 6.6 percent respondents feedback is taken within 16-30 days. 24.1 percent respondents' feedback is taken in between 1 month to 3 months. 30.2 percent respondents' feedback is taken in between 4 months to 6 months followed by 12.7 percent respondents feedback is taken after 7 months and above.

Graph 5.24: Frequency of Feedback from Staff



The Graph 5.24 clearly indicates the duration of taking feedback of users by management 26.4 percent respondents take feedback after 1-15 days, 6.6 percent respondents takes feedback 16-30 days. Further 24.1 percent respondents get feedback 1 month to 3 months, 30.2 percent respondents goes for 4 months to 6 months and 12.7 percent respondents' takes feedback by 7 months and above.

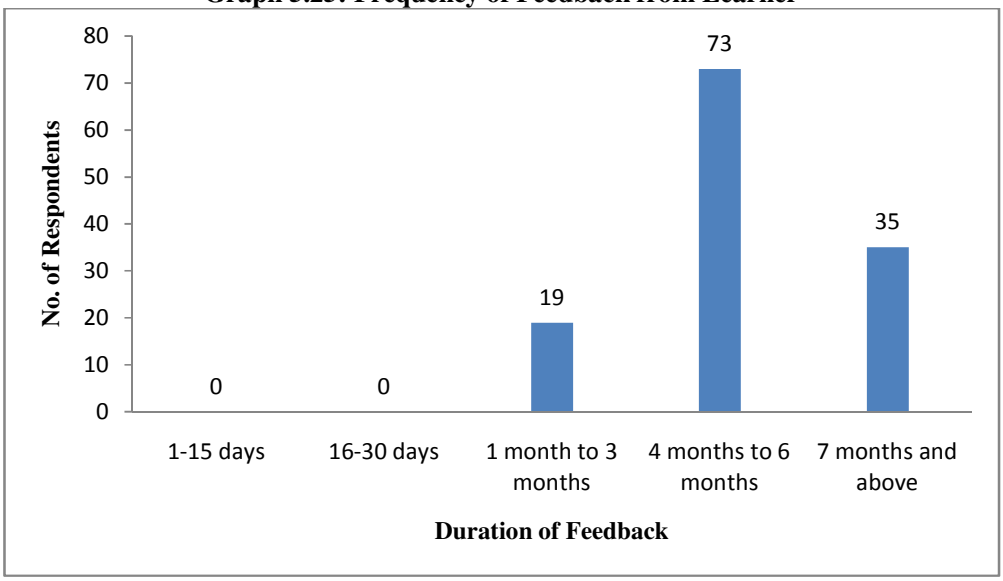
5.2.8.2 Frequency of feedback w.r.t. learner

Table No 5.27: Frequency of Feedback from Learner

Duration of Feedback	No. of Respondents	Percent
1-15 days	0	0
16-30 days	0	0
1 month to 3 months	19	15.0
4 months to 6 months	73	57.5
7 months and above	35	27.5
Total	**127**	**100.0**

Table no. 5.27 shows out of 127 respondent's duration of feedback taken by management for 1-15 days and 16-30 days there are no any respondents. 15.0 percent respondents' feedback is taken in between 1 month to 3 months. 57.5 percent respondents' feedback is taken in between 4 months to 6 months followed by 27.5 percent respondents feedback is taken after 7 months and above.

Graph 5.25: Frequency of Feedback from Learner



Graph 5.25 clearly indicates the duration of taking feedback of users by management 15.0 percent respondents' feedback is taken for 1 month to 3 months, most of the respondents' 57.5 percent feedback is taken 4 months to 6 months and 27.5 percent respondents' feedback is taken after 7 months and above. Further for 1-15 days and 16 -30 days management don't think of taking feedback on EERP system.

Summary

The highest percentage of duration for taking feedback by Board of Director / Management is about 30.2 percent for Staff and 57.5 percent for Learner is 4 months to 6 months in Technical and Health Science. Whereas 12.7 percent for Staff and 27.5 percent for Learners feedback is taken after 7 months for Technical and Health Science by Board of Director / Management.

5.3 Degree of satisfaction of stakeholders

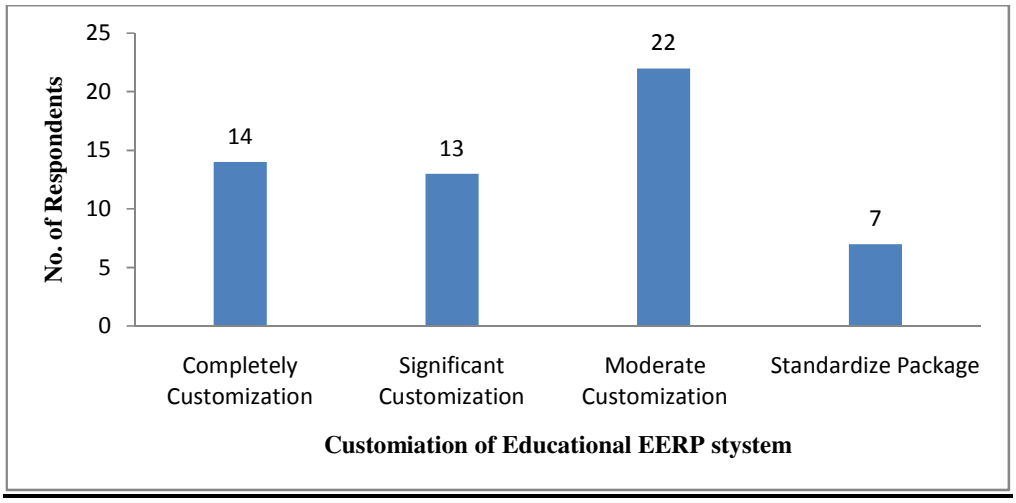
5.3.1 Customization of Educational ERP system

Table No. 5.28: Customization of Educational ERP system

Customization of Educational ERP System	No. of Respondents	Percent
Completely Customization	14	25.0
Significant Customization	13	23.2
Moderate Customization	22	39.3
Standardize Package	7	12.5
Total	**56**	**100.0**

Table No 5.28shows the distribution of customization of Educational ERP system from the vendor. It is observed that 25.0 percent respondents ask for the completely customization of EERP system followed by 23.2 percent ask for Significant Customization , 39.3 percent respondents ask for moderate customization and only 12.5 percent respondents go for the standardize package without making changes in the business process of EERP system.

Graph 5.26: Customization of Educational ERP system



The Graph 5.26 clearly indicates about how significantly organization has customized their EERP system from the vendors is 25.0 percent of respondents have completely customized the EERP system, 23.2 percent respondents have significantly customized the EERP system, 39.3 percent respondents have moderately customized and 12.5 percent respondents have taken the standardize package where in they have not modified any process of existing system.

Summary:

The majority of Institutes from Technical and Health Science goes for customization of Educational ERP system as compare to standardize package. The majority of Institutes have moderately customized Educational ERP system which is 39.3 percent followed by 25.0 percent completely customized.

5.3.2 Influencing Factors

5.3.2.1 Factors that normally influence organizations w.r.t Management

Table No: 5.29: Factors that normally influence organizations from Management

Sr. No.	Factors that normally influence organizations' EERP System	No. of respondents					Rank (M)	Avg Value	Rank Order
		1	2	3	4	5			
1	Decision Making tools	0	0	8 (14.3)	42 (75.0)	6 (10.7)	1	3.96	3.96
2	Educational ERP system fulfill your objectives	0	1 (1.8)	11 (19.6)	38 (67.9)	6 (10.7)	2	3.91	3.88
3	Increased in productivity	0	3 (5.4)	24 (42.9)	19 (33.9)	10 (17.9)	3	3.75	3.64
4	Time saving	0	0	23 (41.1)	25 (44.6)	8 (14.3)	4	3.73	3.73
5	Monitoring System or Dashboard	0	2 (3.6)	23 (41.1)	28 (50.0)	3 (5.4)	5	3.64	3.57
6	Record storage & archiving and retrieval	0	3 (5.4)	27 (48.2)	20 (35.7)	6 (10.7)	6	3.63	3.52
7	Efficient for inter-departmental coordination	0	6 (10.7)	24 (42.9)	24 (42.9)	2 (3.6)	7	3.61	3.39
8	Is the organization getting satisfactory Return On Investment	0	4 (7.1)	32 (57.1)	18 (32.1)	2 (3.6)	8	3.46	3.32

(Note :Average scale on 1 to 5 (where Strongly Disagree(SD) =1; Disagree (D) =2; Neutral(N) =3; Agree (A) =4; Strongly Agree(SA) = 5))

An attempt is made to assess the **Factors that normally influence organizations' EERP System** related statements which can state to what extend respondents agree with the statements. Each item is measured on a five-point Likert Scale with strongly disagree allotted a score of 1 and strongly agree a score of 5 points as the extremities of the scale and asking them to rank their opinions. 1 and 2 points are very low response while 4 and 5 points in favor of delivery channel and which is user friendly. Point 3 represents neutrality between the

two. From the responses of **Board of study / management**, average value is calculated with regard to each observation. These observations are then ranked on the basis of average value. As regards average value of cost related agree or disagree of the statements.

Table No. 5.29 shows the various statements for assessment the **Factors that normally influence organizations' EERP System** related statements and their ranks. To meet the objective question is designed by using various statements which defines the level of statements related to factors which normally influence organizations' EERP System. It is observed that for each statement average scale is in-between 1 to 5 that is in-between strongly disagree to strongly agree.

It is seen that highest average value is 3.96 for Decision Making tools followed by average value 3.91 for Educational ERP system fulfill your objectives and average value 3.75 for increased in productivity, 3.73 for Time saving, average value 3.64 Monitoring System or Dashboard, 3.63 Record storage & archiving and retrieval, 3.61 Efficient for inter-departmental coordination followed by average value 3.46 is the organization getting satisfactory Return On Investment.

Apart from these benefits it is observed that average value 3.96 which is close to the point agree which means that still board of director / management has to decide on which factors influence the implementation of EERP system in the organization so that the organizational expectation will be satisfied.

Table No. 5.29 also shows the ranks of each **Factors that normally influence organizations' EERP System** related statements which are used for assessment of influence factor for implementing EERP system. According to table, Decision Making toolsprefer to go for EERP system and they gave **First** rank for it. Educational ERP system fulfills your objectives after implementing given the **second** rank. The motto behind implementing EERP system is to increase in productivity so they gave **third** rank for it. After increase in productivity we can save time so Time saving is given **Fourth** rank and so on and **Eighth** rank is given to the cost of EERP system which can give return on investment.

5.3.2.2 Factors that normally influence organizations w.r.t Staff

Table No. 5.30: Factors that normally influence organizations from Staff

Sr. No.	Factors that normally influence organizations' EERP System	No. of respondents					Rank (F)	Avg Value	Rank Order
		1	2	3	4	5			
1	Educational ERP system fulfill your objectives	3 (0.8)	16 (4.1)	89 (23.1)	215 (55.7)	63 (16.3)	1	3.94	3.83
2	Decision Making tools	4 (1.0)	22 (5.7)	81 (21.0)	231 (59.8)	48 (12.4)	2	3.92	3.77
3	Time saving	2 (0.5)	17 (4.4)	118 (30.6)	178 (46.1)	71 (18.4)	3	3.88	3.77
4	Record storage & archiving and retrieval	1 (0.3)	46 (11.9)	127 (32.9)	143 (37.0)	69 (17.9)	4	3.85	3.60
5	Monitoring System or Dashboard	3 (0.8)	28 (7.3)	129 (33.4)	183 (47.4)	43 (11.1)	5	3.78	3.61
6	Increased in productivity	8 (2.1)	20 (5.2)	144 (37.3)	164 (42.5)	50 (13.0)	6	3.78	3.59

(Note :Average scale on 1 to 5 (where Strongly Disagree(SD) =1; Disagree (D) =2; Neutral(N) =3; Agree (A) =4; Strongly Agree(SA) = 5))

An attempt is made to assess the **Factors that normally influence organizations' EERP System** related statements which can state to what extend respondents agree with the statements. Each item is measured on a five-point Likert Scale with strongly disagree allotted a score of 1 and strongly agree a score of 5 points as the extremities of the scale and asking them to rank their opinions. 1 and 2 points are very low response while 4 and 5 points in favor of delivery channel and which is user friendly. Point 3 represents neutrality between the two. From the responses of **Board of study / management**, average value is calculated with regard to each observation. These observations are then ranked on the basis of average value. As regards average value of cost related agree or disagree of the statements.

Table No. 5.30 shows the various statements for assessment the **Factors that normally influence organizations' EERP System** related statements and their ranks. To meet the objective question is designed by using various statements which defines the level of statements related to factors which normally influence organizations' EERP System. It is observed that for each

statement average scale is in-between 1 to 5 that is in-between strongly disagree to strongly agree.

It is seen that highest average value is 3.94 for Educational ERP system fulfill your objectives, average value 3.92 for Decision Making tools followed by average value 3.88 for Educational ERP system Time saving, 3.85 for Record storage & archiving and retrieval, average value 3.78 Monitoring System or Dashboard followed by average value 3.58 for Increased in productivity.

Apart from these benefits it is observed that average value 3.94 which is close to the point agree which means that still staff has to decide on which factors the management should think and purchase the EERP system in organization.

Table no. 5.30 also shows the ranks of each **Factors that normally influence organizations' EERP System** related statements which are used for assessment of influence factor for implementing EERP system. According to table, Educational ERP system fulfill your objectives prefer to go for EERP system and they gave **First** rank for it. Decision making tools is given the **second** rank. The motto behind implementing EERP system is time saving so they gave **third** rank for it. Further Record storage & archiving and retrieval given **Fourth** rank for it and so on and **sixth** rank is given to Increased in productivity.

5.3.2.3 Factors that normally influence organizations w.r.t Learner

Table No. 5.31: Factors that normally influence organizations from Learner

Factors that normally influence organizations' EERP System	No. of respondents					Rank (L)	Rank Order	Avg Value
	1	2	3	4	5			
Educational ERP system fulfill your objectives	0 (0.0)	0 (0.0)	77 (19.6)	215 (54.8)	100 (25.5)	1	4.06	4.06
Decision Making tools	0 (0.0)	0 (0.0)	97 (24.7)	236 (60.2)	59 (15.1)	2	3.90	3.90
Time saving	0 (0.0)	1 (0.3)	206 (52.6)	125 (31.9)	60 (15.3)	3	3.63	3.62
Monitoring System or Dashboard	0 (0.0)	0 (0.0)	218 (55.6)	141 (36.0)	33 (8.4)	4	3.53	3.53

(Note :Average scale on 1 to 5 (where Strongly Disagree(SD) =1; Disagree (D) =2; Neutral(N) =3; Agree (A) =4; Strongly Agree(SA) = 5))

An attempt is made to assess the **Factors that normally influence organizations' EERP System** related statements which can state to what extend respondents agree with the statements. Each item is measured on a five-point Likert Scale with strongly disagree allotted a score of 1 and strongly agree a score of 5 points as the extremities of the scale and asking them to rank their opinions. 1 and 2 points are very low response while 4 and 5 points in favor of delivery channel and which is user friendly. Point 3 represents neutrality between the two. From the responses of **Learner**, average value is calculated with regard to each observation. These observations are then ranked on the basis of average value. As regards average value of cost related agree or disagree of the statements.

Table No. 5.31 shows the various statements for assessment the **Factors that normally influence organizations' EERP System** related statements and their ranks. To meet the objective question is designed by using various statements which defines the level of statements related to factors which normally influence organizations' EERP System. It is observed that for each statement average scale is in-between 1 to 5 that is in-between strongly disagree to strongly agree.

It is seen that highest average value is 4.06 for Educational ERP system fulfill your objectives followed by average value 3.90 for Decision Making tools and average value 3.62 for Time saving and average value 3.53 Monitoring System or Dashboard.

Apart from these benefits it is observed that average value 4.06 which is close to the point agree which means that still board of director / management has to decide on which factors influence the implementation of EERP system in the organization so that the organizational expectation will be satisfied.

Table No. 5.31 also shows the ranks of each **Factors that normally influence organizations' EERP System** related statements which are used for assessment of influence factor for implementing EERP system. According to table, Educational ERP system fulfills your objectivesprefer to go for EERP

system and they gave **First** rank for it. Decision Making tools implementing is given the **second** rank. The motto behind implementing EERP system is to Time Saving so they gave **third** rank for it and for Monitoring System or Dashboard is given **Fourth** rank.

5.3.3 Refer Para No. Mode of Communication 5.2.2

5.3.4 User Interface

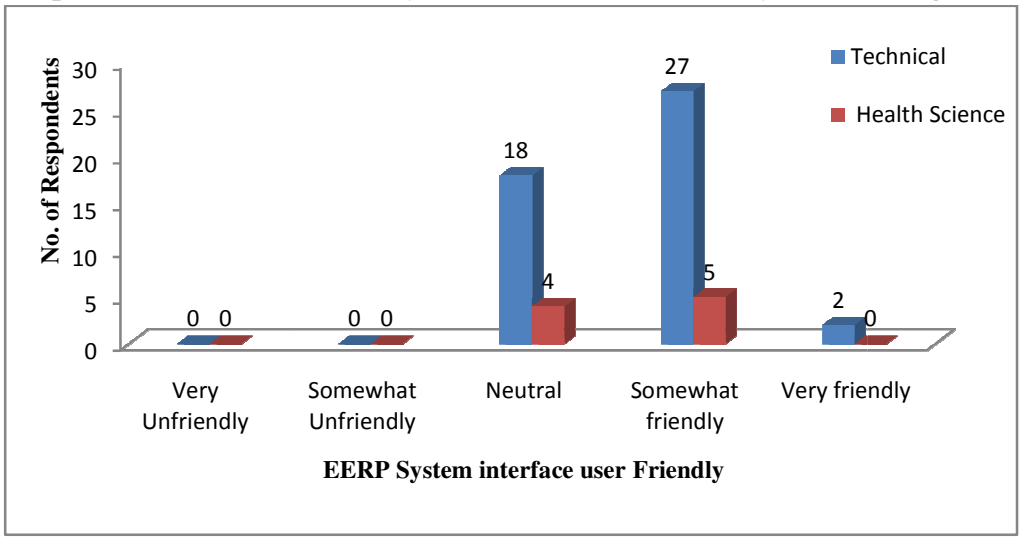
5.3.4.1 Educational ERP system interface user friendly w.r.t. Management

Table No: 5.32: Educational ERP system interface user friendly from Management

EERP System interface user Friendly	No. of Respondents from Technical	No. of Respondents from Health Science
Very Unfriendly	0	0
Somewhat Unfriendly	0	0
Neutral	18 (38.30)	4 (44.44)
Somewhat friendly	27 (57.45)	5 (55.56)
Very friendly	2 (4.26)	0
Total	**47**	**9**

Table no. 5.32 shows the distribution of data collected from 56 respondents out of which 47 respondents from Technical and 9 respondents from Health Science category. None of the respondents say EERP system is unfriendly from Technical category, where as none of the respondents comes under unfriendly from Health Science. Further 38.30 percent respondents are neutral towards interface user friendly from Technical and 44.44 percent respondents are neutral from Health Science. Followed by 61.71 percent respondents are satisfied with EERP system user interface from Technical and 55.56 percent respondents from Health science category

Graph 5.27: Educational ERP system interface user friendly from Management



The Graph 5.27 clearly indicates that the respondents are somewhat friendly and very friendly is more than 50.00 percent of Educational ERP system interface which indicates that the user interface is designed as per the requirement of users.

5.3.4.2 Educational ERP system interface user friendly w.r.t. Staff

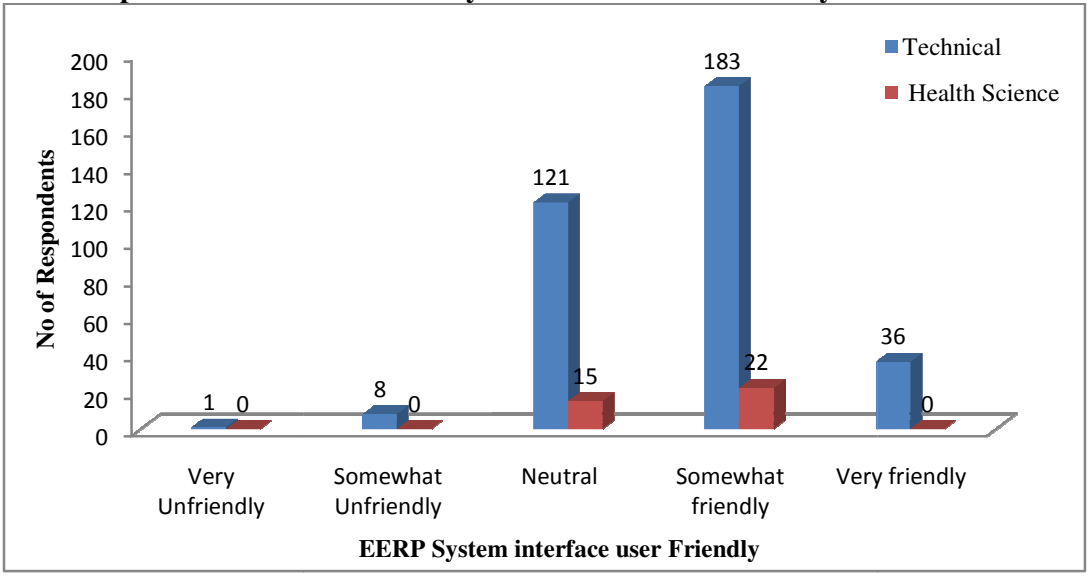
Table No. 5.33:Educational ERP system interface user friendly from Staff

EERP System interface user Friendly	No. of Respondents from Technical	No. of Respondents from Health Science
Very Unfriendly	1 (0.29)	0
Somewhat Unfriendly	8 (2.29)	0
Neutral	121 (34.67)	15 (40.54)
Somewhat friendly	183 (52.44)	22 (59.46)
Very friendly	36 (10.32)	0
Total	**349**	**37**

Table No. 5.33 shows the distribution of data collected from 386 respondents out of which 349 respondents from Technical and 37 respondents from Health Science category. Total 2.58 percent respondents say EERP system is unfriendly from Technical category, where as none of the respondents comes under unfriendly from Health Science. Further 34.67 percent respondents are neutral towards interface user friendly from Technical and 40.54 percent respondents are neutral from Health Science. Followed by 62.76 percent

respondents are satisfied with EERP system user interface from Technical and 59.46 percent respondents from Health science category.

Graph 5.28:Educational ERP system interface user friendly from Staff



The Graph 5.28 clearly indicates that the user interface of Educational ERP system is more than 50.00 percent which is 62.76 percent respondents are satisfied with EERP system user interface from Technical and 59.46 percent respondents from Health science category. Hence the interface provided by vendors is as per the requirement of EERP users.

5.3.4.3 Educational ERP system interface user friendly w.r.t. Learner

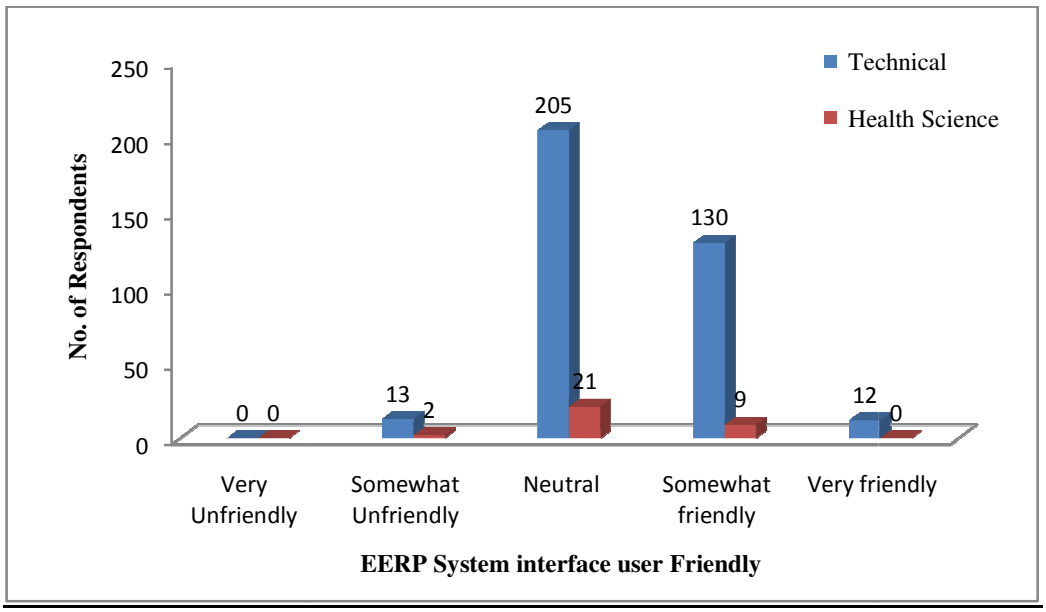
Table No: 5.34: Educational ERP system interface user friendly from Learner

EERP System interface user Friendly	No. of Respondents from Technical	No. of Respondents from Health Science
Very Unfriendly	0	0
Somewhat Unfriendly	13 (3.61)	2 (6.25)
Neutral	205 (56.94)	21 (65.63)
Somewhat friendly	130 (36.11)	9 (28.13)
Very friendly	12 (3.33)	0
Total	**360**	**32**

Table No. 5.34 shows the representation of collected data from 392 respondents out of which 360 respondents from Technical and 32 respondents from Health Science category. Total 3.61 percent respondents say EERP

system is somewhat or very unfriendly from Technical category, where as only 6.25 percent respondents comes under somewhat or very unfriendly from Health Science. Further 56.94 percent respondents are neutral towards interface user friendly from Technical and 65.63 percent respondents are neutral from Health Science. Followed by 39.44 percent respondents are satisfied with EERP system user interface from Technical and 28.13 percent respondents from Health science category.

Graph 5.29: Educational ERP system interface user friendly from Learner



The Graph 5.29 clearly indicates the operation of EERP system is not user friendly, looking at the graph it clearly indicate that the system interface is unfriendly as compare to Management and Staff. Hence Educational ERP system interface should be designed looking at the youth of the country.

Summary:

The User Interface of respondents figures indicates the operation of Educational ERP system is not user friendly, the system interface for Learners is unfriendly as compare to Management and Staff. Hence Educational ERP system interface should be designed looking at the Learners point of view which is youth of tomorrow who can transform the better technology which will communicate to the mass.

5.3.5 Usages of Educational ERP System

5.3.5.1 Usages of Educational ERP provided to users w.r.t. Management

Table No 5.35:Usages of Educational ERP provided to users from Management

Sr. No.	Usage of EERP System	No. of respondents				Total	Rank
		Yes	%	No	%		
1	**News / Events information**	38	67.9	18	32.1	56	**1**
2	**Exam Date Information**	37	66.1	19	33.9	56	**2**
3	**Admission Confirmations**	37	66.1	19	33.9	56	**3**
4	**Placement schedules / selection / cancellation**	35	62.5	21	37.5	56	**4**
5	**Fees Information**	31	55.4	25	44.6	56	**5**
6	**Individual SMS messages**	17	30.4	39	69.6	56	**6**
7	**Urgent alerts to parents/students**	15	26.8	41	73.2	56	**7**
8	**Group SMS messages**	15	26.8	41	73.2	56	**8**
9	**Holidays information**	13	23.2	43	76.8	56	**9**
10	**Result publication on SMS**	8	14.3	48	85.7	56	**10**
11	**Customized wishes**	7	12.5	49	87.5	56	**11**
12	**Student's Progress Report / Activities Information to parents**	7	12.5	49	87.5	56	**12**
13	**Contact information & Address**	6	10.7	50	89.3	56	**13**
14	**Homework information**	5	8.9	51	91.1	56	**14**
15	**Daily attendance for students parents (auto generated)**	4	7.1	52	92.9	56	**15**
16	**Bus information**	3	5.4	53	94.6	56	**16**

Table No. 5.35 shows the usages of EERP system provided to stakeholder in organization and their ranking according to organization point of view. It shows that out of 56 respondents' 67.5 percent organization makes usage of News / Events information followed by 66.1 percent respondents make use of Exam Date Information and Admission Confirmations. Further 62.5 percent respondents make usage of Placement schedules / selection / cancellation, 55.4 percent respondents gives information about Fees Information, 30.4 percent respondents make use of Individual SMS messages, 26.8 percent respondents make use of Urgent alerts to parents/students and Group SMS messages, 23.2 percent respondents make use of Holidays information. The least response for usage is given to Daily attendance for students' parents (auto generated) which is 7.1 percent.

According to responses from organization about EERP system and their rank, utilization of functionality to communicate to stakeholder the rank for **News / Events information**is given **one** and followed by rank **secondExam Date**

Information. The least priority is given to usage **Bus information** at rank **Sixteenth.**

Summary:

Most of the Board of Director / Management make usage of Educational ERP system are New / Events Information which is 67.9 percent make use to communicate with staff and Learner whereas 32.1 percent are not in favor of communicating with staff and Learner. Most of Board of Director / Management Make use of usages to communicate with staff and Learner are Exam Date Information and Admission Confirmations (66.1 Percent), Placement schedules / selection / cancellation (62.5 percent) and Fees Information (55.4 Percent) whereas other than these usages of Educational ERP system are below 50 percent are Individual SMS messages, Urgent alerts to parents/students, Group SMS messages, Holidays information, Result publication on SMS, Customized wishes, Student's Progress Report / Activities Information to parents, Contact information & Address, Homework information, Daily attendance for students parents (auto generated) and Bus information. Board of Director / Management has ranked the Educational ERP system by their preference of Usage.

5.3.5.2 Usages of Educational ERP provided to users w.r.t. Learner

Table No. 5.36: Usages of Educational ERP provided to users from Learner

Sr. No.	Usage of EERP System	No. of respondents				Total	Rank
		Yes	%	No	%		
1	Placement schedules / selection / cancellation	373	95.2	19	4.8	392	**1**
2	Fees Information	316	80.6	76	19.4	392	**2**
3	News / Events information	286	73	106	27	392	**3**
4	Exam Date Information	273	69.6	119	30.4	392	**4**
5	Admission Confirmations	130	33.2	262	66.8	392	**5**
6	Individual SMS messages	95	24.2	297	75.8	392	**6**
7	Result publication on SMS	32	8.2	360	91.8	392	**7**
8	Urgent alerts to parents/students	18	4.6	374	95.4	392	**8**
9	Holidays information	18	4.6	374	95.4	392	**9**
10	Customized wishes	12	3.1	380	96.9	392	**10**
11	Student's Progress Report / Activities Information to parents	3	0.8	389	99.2	392	**11**
12	Bus information	2	0.5	390	99.5	392	**12**
13	Daily attendance for students parents (auto generated)	0	0	392	100	392	**13**
14	Group SMS messages	0	0	0	0	392	**14**

Table No. 5.36 shows the usages of EERP system provided to stakeholder in organization and their ranking according to organization point of view. It shows that out of 392 respondents' 95.2 percent organization makes usage of Placement schedules / selection / cancellation followed by 80.6 percent respondents make use of Fees Information. Further 73.0 percent respondents make usage of News / Events information, 69.6 percent respondents gives information about Exam Date Information, 33.2 percent respondents make use of Admission Confirmations, 24.2 percent respondents make use of Individual SMS messages. The least response for usage is given to Group SMS messages and Individual SMS messages which is 0.0 percent.

According to responses from organization about EERP system and their rank, utilization of functionality to communicate to stakeholder the rank for Placement schedules / selection / cancellation is given **one** and followed by rank **second**Fees Information. The least priority is given to usage Group SMS messages and Individual SMS messages at rank **Thirteen** and **Fourteen** respectively.

Summary:

Most of the Learners expect from Board of Director / Management to make usage of Educational ERP system are Placement schedules / selection / cancellation (95.2 percent), Fees Information (80.6 percent), News / Events information (73.00 percent) and Exam Date Information (69.6 percent). The Learners are least bothered of usages made by Board of Director / Management of Educational ERP are Admission Confirmations, Individual SMS messages, Result publication on SMS, Urgent alerts to parents/students, Holidays information, Customized wishes, Student's Progress Report / Activities Information to parents, Bus information. Response for the usage of Daily attendance for students parents (auto generated) and Group SMS messages is negligible as compare to other usages of Educational ERP system. Learner has ranked the Educational ERP system by their preference of Usage.

5.3.6 Performance of Educational ERP system

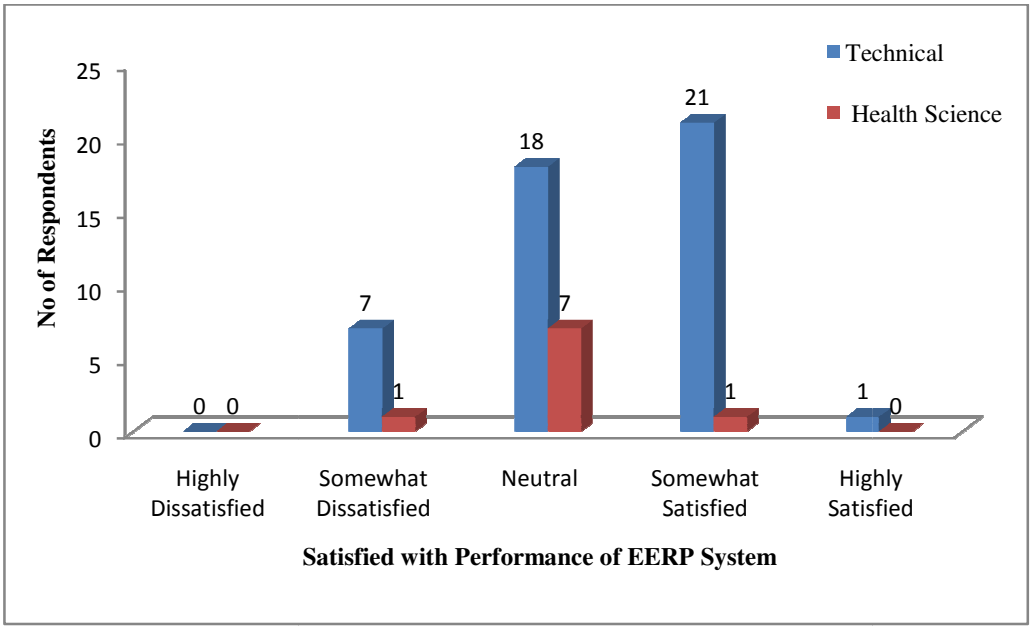
5.3.6.1 Performance of the ERP system w.r.t. Management

Table No 5.37: Satisfaction with the performance of the ERP system from Management

Satisfied with Performance of EERP System	No. of Respondents from Technical	No. of Respondents from Health Science
Highly Dissatisfied	0	0
Somewhat Dissatisfied	7 (14.89)	1 (11.11)
Neutral	18 (38.30)	7 (77.78)
Somewhat Satisfied	21 (44.68)	1 (11.11)
Highly Satisfied	1 (2.13)	0
Total	**47**	**9**

Table No. 5.37 shows the distribution of data collected from 56 respondents out of which 49 respondents from Technical and 9 respondents from Health Science category. Total 14.89 percent respondents are somewhat or highly dissatisfied with the performance of EERP system for Technical Institutes and 11.11 percent respondents is somewhat or highly dissatisfied with the performance of EERP system for Health Science. Further 38.30 percent respondents are neutral towards the performance of EERP system from Technical and 77.78 percent respondents are neutral from Health Science. Followed by 46.81 percent respondents are somewhat or highly satisfied with the performance of the EERP system from Technical and 11.11 percent respondent are somewhat satisfied with the performance of EERP system from Health Science category.

Graph 5.30: Satisfaction with the performance of the ERP system from Management



Graph 5.30 shows the representation of performance of EERP system where 46.81 percent respondents are somewhat or highly satisfied with the performance of the EERP system from Technical and 11.11 percent respondent are somewhat satisfied with the performance of EERP system from Health Science category. Therefore the overall performance of EERP system is not upto the mark which is expected by Management.

5.3.6.2 Performance of the ERP system w.r.t. Staff

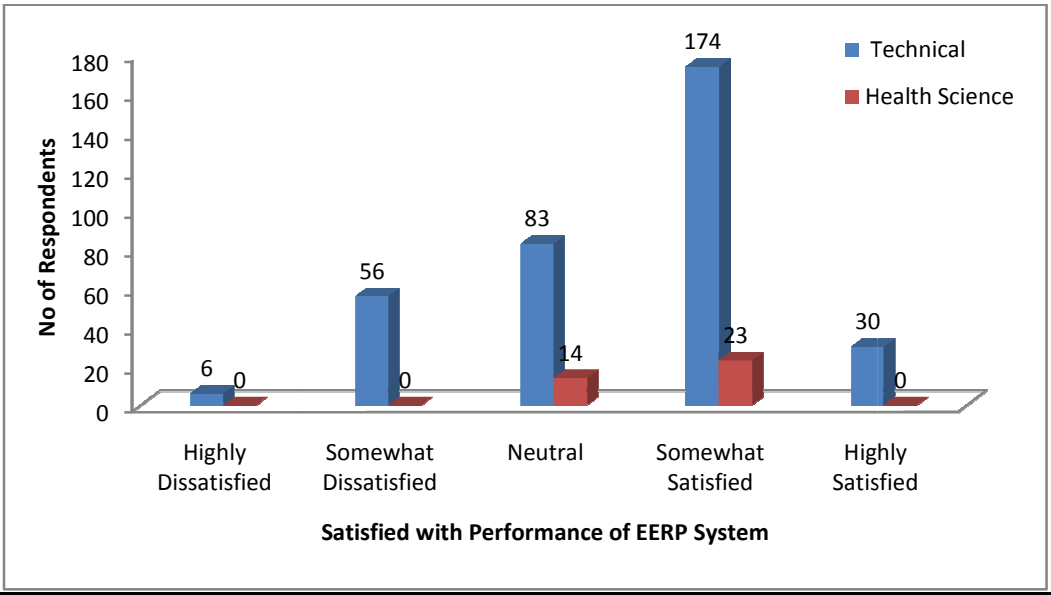
Table No 5.38: Satisfaction with the performance of the ERP system from Staff

Satisfied with Performance of EERP System	No. of Respondents from Technical	No. of Respondents from Health Science
Highly Dissatisfied	6 (1.72)	0
Somewhat Dissatisfied	56 (16.05)	0
Neutral	83 (23.78)	14 (37.84)
Somewhat Satisfied	174 (49.86)	23 (62.16)
Highly Satisfied	30 (8.60)	0
Total	**349**	**37**

Table No. 5.38 shows the distribution of data collected from 386 respondents out of which 349 respondents from Technical and 37 respondents from Health Science category. Total 17.77 percent respondents are somewhat or highly

dissatisfied towards the performance of EERP system with Technical and none of the respondents are satisfied with the performance of EERP system with Health Science. Further 23.78 percent respondents are neutral with Technical and 37.84 percent respondents are neutral with Health Science category. Followed by 58.46 percent respondents are satisfied with the performance of EERP system for Technical and 62.16 percent respondents are satisfied with the performance of EERP system for Health Science category.

Graph 5.31: Satisfaction with the performance of the ERP system from Staff



Graph 5.31 shows the representation of data in pictorial format which indicates that 58.46 percent respondents are satisfied with the performance of EERP system for Technical and 62.16 percent respondents are satisfied with the performance of EERP system for Health Science category. Therefore the performance of EERP provided to staff is satisfactory as compare to performance of EERP system by management.

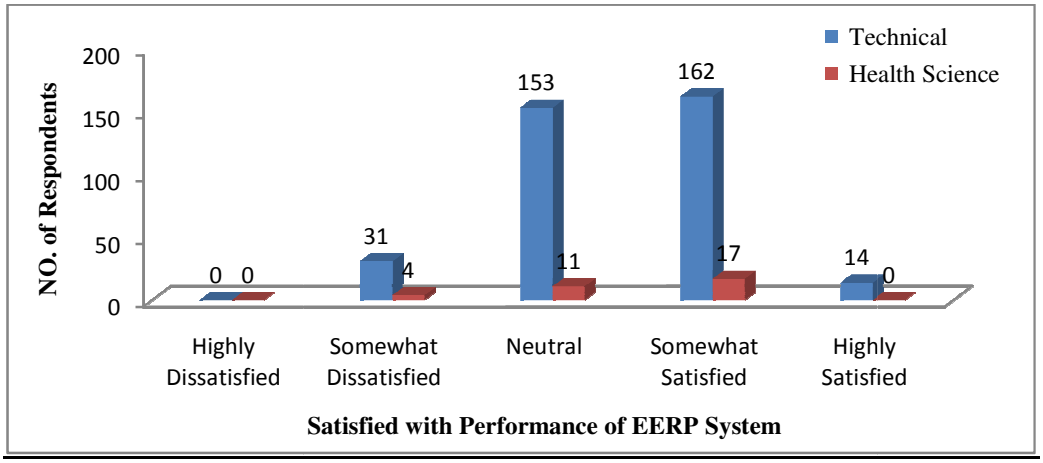
5.3.6.3 Performance of the ERP system w.r.t. Learner

Table No 5.39: Satisfaction with the performance of the ERP system from Learner

Satisfied with Performance of EERP System	No. of Respondents from Technical	No. of Respondents from Health Science
Highly Dissatisfied	0	0
Somewhat Dissatisfied	31 (8.61)	4 (12.50)
Neutral	153 (42.50)	11 (34.38)
Somewhat Satisfied	162 (45.00)	17 (53.13)
Highly Satisfied	14 (3.89)	0
Total	**360**	**32**

Table No. 5.39 shows the distribution of data collected from 392 respondents out of which 360 respondents from Technical and 32 respondents from Health Science category. Total 8.61 percent respondents are somewhat or highly dissatisfied towards the performance of EERP system with Technical and 12.50 percent respondents are satisfied with the performance of EERP system with Health Science. Further 42.50 percent respondents are neutral with Technical and 34.38 percent respondents are neutral with Health Science category. Followed by 48.89 percent respondents are satisfied with the performance of EERP system for Technical and 53.13 percent respondents are satisfied with the performance of EERP system for Health Science category.

Graph 5.32: Satisfaction with the performance of the ERP system from Learner



Graph 5.32 indicates that 48.89 percent respondents are satisfied with the performance of EERP system for Technical and 53.13 percent respondents are satisfied with the performance of EERP system for Health Science category.

Therefore the learners from Health Science are satisfied with the performance of EERP system as compare to learners from Technical Institutes.

Summary:

The Majority of respondents from Board of Director / Management from Technical Institutes are less satisfied (46.81 percent) than that of Health Science Institutes (11.11 percent) whereas Staff from Technical and Health Science Institutes are more satisfied with the performance of Educational ERP system which is 58.46 percent and 62.16 percent respectively. Further Learners from Health Science (53.13 percent) are more satisfied than that of Technical Institutes (48.89 percent). Therefore, the learners from Technical Institutes are more Technical Savvy than that of Learners from Health Science Institutes.

5.3.7 Reasons of dis-satisfaction of Educational ERP system

5.3.7.1 Reasons of dis-satisfaction of Educational ERP system w.r.t. Management

Table No: 5.40 Reasons of dis-satisfaction from Management

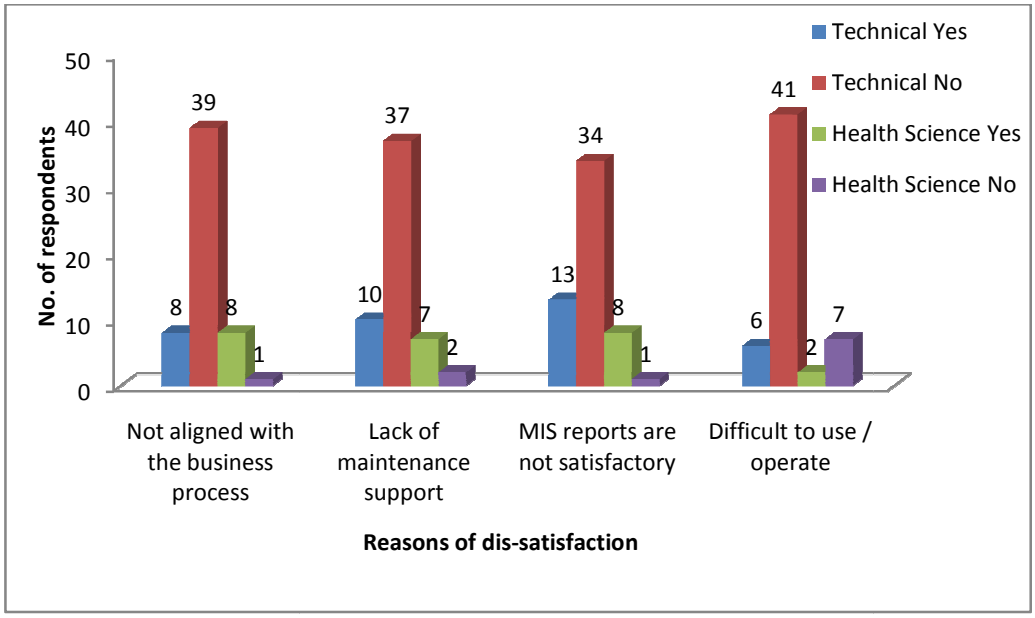
Sr. No.	Reasons of Dis-satisfaction	No. of respondents				Total
		Technical		Health Science		
		Yes	No	Yes	No	
1	Not aligned with the business process	8 (17.02)	39 (82.98)	8 (88.89)	1 (11.11)	56
2	Lack of maintenance support	10 (21.28)	37 (78.72)	7 (77.78)	2 (22.22)	56
3	MIS reports are not satisfactory	13 (27.66)	34 (72.34)	8 (88.89)	1 (11.11)	56
4	Difficult to use / operate	6 (12.77)	41 (87.23)	2 (22.22)	7 (77.78)	56

.

Table no. 5.40 shows the distribution of reasons for dissatisfaction of using EERP system for Technical and Health Science Institutes with statements keeping into considerations like not aligned with the business process, Lack of maintenance support, MIS reports are not satisfactory and difficult to use / operate. Most of the respondents i.e. 27.66 percent respondents are dissatisfied for MIS reports are not satisfactory with Technical Institutes whereas 88.89 percent respondents are dissatisfied for MIS reports are not satisfactory with Health Science Institutes. Further 21.28 percent respondents are dissatisfied for Lack of maintenance support with Technical Institutes whereas 77.78

percent respondents are dissatisfied for Lack of maintenance support with Health Science Institutes followed by 17.02 percent respondents are dissatisfied for Not aligned with the business process with Technical Institutes whereas 88.89 percent respondents are dissatisfied for Not aligned with the business process with Health Science Institutes. Further 12.77 percent respondents are dissatisfied with Difficult to use / operate for Technical Institutes whereas 22.22 percent respondents are dissatisfied with Difficult to use / operate for Health Science Institutes.

Graph 5.33: Reasons of dis-satisfaction from Management



Graph 5.33 represents the pictorial information about reasons of dis-satisfaction where management of Health Science Institutes is dis-satisfied more than that of Technical Institutes

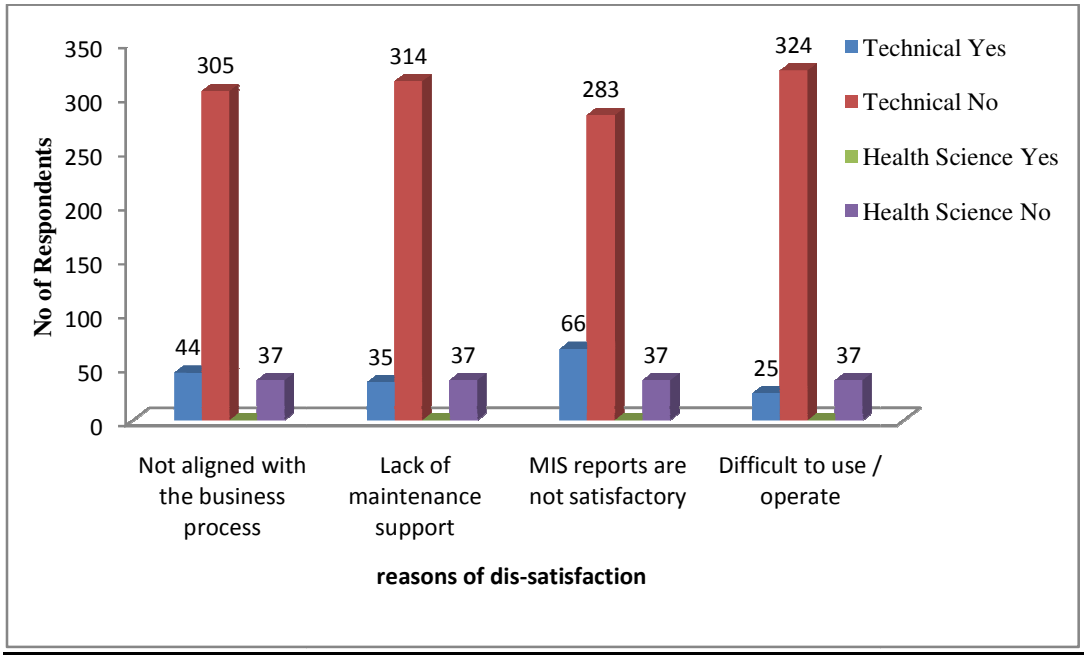
5.3.7.2 Reasons of dis-satisfaction of Educational ERP system w.r.t. Staff

Table No: 5.41 Reasons of dis-satisfaction from Staff

Sr. No.	reasons of dis-satisfaction	No. of respondents				Total
		Technical		Health Science		
		Yes	No	Yes	No	
1	Not aligned with the business process	44 (12.61)	305 (87.39)	0	37 (100)	386
2	Lack of maintenance support	35 (10.03)	314 (89.97)	0	37 (100)	386
3	MIS reports are not satisfactory	66 (18.91)	283 (81.09)	0	37 (100)	386
4	Difficult to use / operate	25 (7.16)	324 (92.84)	0	37 (100)	386

Table No. 5.41 shows the distribution of reasons for dis-satisfied with the performance of EERP system. Researcher has collected data out of which 12.61 percent respondents are dis-satisfied due to Not aligned with the business process, 10.03 percent respondents are dis-satisfied due to the reason lack of maintenance support, 18.91 percent respondents are dis-satisfied due to the reason MIS reports are not satisfactory and 7.16 percent respondents are dis-satisfied due to the reason Difficult to use / operate in Technical Category. In Health Science category none of the respondents are dis-satisfaction with the performance of the EERP system.

Graph 5.34: Reasons of dis-satisfaction from Staff



Graph 5.34 shows the representation of respondents data from Technical and Health Science category and checks the reasons for dis-satisfied with the performance of EERP system.The level of dis-satisfaction of Technical Institutes staff is more as compare to the dis-satisfaction of Health Science Respondents.

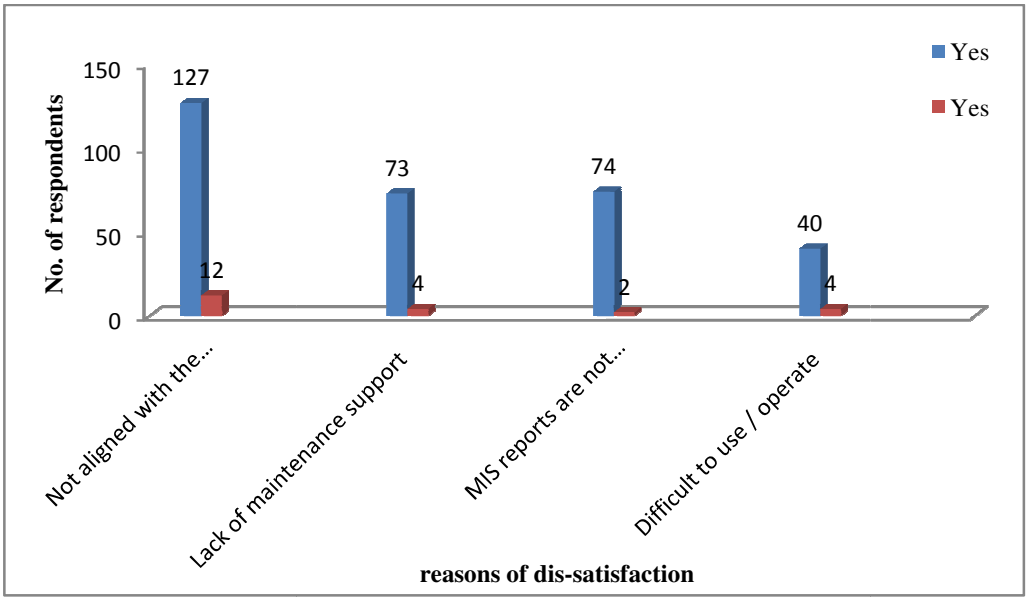
5.3.7.3 Reasons of dis-satisfaction of Educational ERP system w.r.t. Learner

Table No: 5.42 Reasons of dis-satisfaction from Learner

Sr. No.	reasons of dis-satisfaction	No. of respondents		Total
		Technical	Health Science	
		Yes	Yes	
1	Not aligned with the business process	127 (40.45)	12 (54.55)	139
2	Lack of maintenance support	73 (23.25)	4 (18.18)	77
3	MIS reports are not satisfactory	74 (23.57)	2 (9.09)	76
4	Difficult to use / operate	40 (12.74)	4 (18.18)	44
	Total	314	22	336

Table No. 5.42 shows the distribution of reasons for dis-satisfied learners with the performance of EERP system. Researcher has collected data out of which 40.45 and 54.55 percent respondents are dis-satisfied due to Not aligned with the business process for Technical and Health Science respectively, 23.25 and 18.18 percent respondents are dis-satisfied due to the reason lack of maintenance support for Technical and Health Science respectively, 23.57 and 9.09 percent respondents are dis-satisfied due to the reason MIS reports are not satisfactory for Technical and Health Science respectively and 12.74 and 18.18 percent respondents are dis-satisfied due to the reason Difficult to use / operate for Technical and Health Science respectively.

Graph 5.35: Reasons of dis-satisfaction from Learner



Graph 5.35 represents the pictorial representation of the reasons which are not satisfied for the performance of the EERP system. Most of the respondents from Technical and Health Science respondents are dis-satisfied due to Not aligned with the business process.

Summary:

The majority of respondents from Board of Director / Management from Health Science are dis-satisfied due to Not aligned with the business process (88.89 percent), MIS reports are not satisfactory (88.89 percent) and Lack of maintenance support (77.78) and of Director / Management from Technical Institutes are satisfied with the performance of Educational ERP system. The Staff from Technical and Health Science Institutes are satisfied with the performance of educational ERP system. Further Learners from Technical and Health Science Institutes are dis-satisfied due to the reasons Not aligned with the business process. Therefore the Board of Director / management has to take feedback frequently and change the business process in the implementation phase only.

5.3.8 Educational ERP Provide better management tools

5.4.8.1 Educational ERP Provide better management tools w.r.t. Management

Table No 5.43:Educational ERP Provide better management tools from Management

Sr. No.	Factors that normally influence organizations' EERP System	No. of respondents					Rank (M)	Avg Value	Rank Order
		1	2	3	4	5			
1	Directing and Analyzing	0	14 (25.0)	27 (48.2)	24 (25.0)	1 (1.8)	1	4.25	3.75
2	Decision Making	0	0	8 (14.3	45 (80.4)	3 (5.4)	2	3.91	3.91
3	Planning	0	1 (1.8)	25 (44.6)	27 (48.2)	3 (5.4)	3	3.61	3.57
4	Controlling	0	12 (21.4)	28 (50.0)	15 (26.8)	1 (1.8)	4	3.52	3.09

(Note :Average scale on 1 to 5 (where Strongly Disagree(SD) =1; Disagree (D) =2; Neutral(N) =3; Agree (A) =4; Strongly Agree(SA) = 5))

An attempt is made to assess the **Factors that normally influence organizations' EERP System** related statements which can state to what extend respondents agree with the statements. Each item is measured on a five-point Likert Scale

with strongly disagree allotted a score of 1 and strongly agree a score of 5 points as the extremities of the scale and asking them to rank their opinions. 1 and 2 points are very low response while 4 and 5 points in favor of delivery channel and which is user friendly. Point 3 represents neutrality between the two. From the responses of **Board of study / management**, average value is calculated with regard to each observation. These observations are then ranked on the basis of average value. As regards average value of cost related agree or disagree of the statements.

Table No. 5.43 shows the various statements for assessment the **Factors that normally influence organizations' EERP System** related statements and their ranks. To meet the objective question is designed by using various statements which defines the level of statements related to factors which normally influence organizations' EERP System. It is observed that for each statement average scale is in-between 1 to 5 that is in-between strongly disagree to strongly agree.

It is seen that highest average value is 4.25 for Directing and Analyzing followed by average value 3.91 for Decision Making, average value 3.57 for Planning and average value 3.09 for Controlling.

Apart from these benefits it is observed that average value 3.96 which is above to the point neutral which means that still board of director / management has to decide on which factors influence the management has to take decision to improvise the better management tools which can satisfy the board of directors to control the activities after implementation of EERP system in the organization.

Table no. 5.43 also shows the ranks of each **Factors that normally influence organizations' EERP System** related statements which are used for assessment of better management tool after implementing EERP system. According to table, Directing and Analyzing prefer to go for better management tool for EERP system and they gave **First** rank for it. Educational ERP system decision making tool is better management tool after implementing EERP system given the **second** rank. The motto behind implementing EERP system is to increase in planning activities so they gave

third rank for it. After planning the activity we have to control the system which will help the decision taking authority to go for controlling the activities which has given **Fourth** rank for it.

Summary:

To take decision Board of Director / Management make use of tools like Directing and Analyzing, Decision making, planning and controlling. The better management tools provided through Educational ERP for the management are Directing and Analyzing (Avg. Value 4.25), Decision Making (Avg. Value 3.91), Planning (Avg. Value 3.61) and Controlling (Avg. Value 3.52). The better management tools provided through Educational ERP are ranked using Average Value and preference of Usage.

5.3.8.2 Educational ERP Provide better management tools w.r.t. Staff

Table No 5.44:Educational ERP Provide better management tools from Staff

Sr. No.	Factors that normally influence organizations' EERP System	No. of respondents					Rank (F)	Rank Order	Avg Value
		1	2	3	4	5			
1	Decision Making	9 (2.3)	16 (4.1)	116 (30.1)	199 (51.6)	46 (11.9)	1	3.84	3.67
2	Planning	2 (0.5)	30 (7.8)	131 (33.9)	194 (50.3)	29 (7.5)	2	3.74	3.56
3	Controlling	3 (0.8)	38 (10.6)	166 (43.0)	140 (36.3)	39 (10.1)	3	3.68	3.45
4	Directing and Analyzing	4 (1.0)	59 (15.3)	162 (42.0)	136 (35.2)	25 (6.5)	4	3.66	3.31

(Note :Average scale on 1 to 5 (where Strongly Disagree(SD) =1; Disagree (D) =2; Neutral(N) =3; Agree (A) =4; Strongly Agree(SA) = 5))

An attempt is made to assess the **Factors that normally influence organizations' EERP System** related statements which can state to what extend respondents agree with the statements. Each item is measured on a five-point Likert Scale with strongly disagree allotted a score of 1 and strongly agree a score of 5 points as the extremities of the scale and asking them to rank their opinions. 1 and 2 points are very low response while 4 and 5 points in favor of delivery channel and which is user friendly. Point 3 represents neutrality between the two. From the responses of **staff**, average value is calculated with regard to each observation. These observations are then ranked

on the basis of average value. As regards average value of cost related agree or disagree of the statements.

Table No. 5.44 shows the various statements for assessment the **Factors that normally influence organizations' EERP System** related statements and their ranks. To meet the objective question is designed by using various statements which defines the level of statements related to factors which normally influence organizations' EERP System. It is observed that for each statement average scale is in-between 1 to 5 that is in-between strongly disagree to strongly agree.

It is seen that highest average value is 3.84 for Decision Making followed by average value 3.74 for planning, average value 3.68 for Controlling and average value 3.66 for Directing and Analyzing.

Apart from these benefits it is observed that average value 3.84 which is above to the point neutral which means that still board of director / management has to decide on which factors influence the management has to take decision to improvise the better management tools which can satisfy the board of directors to control the activities after implementation of EERP system in the organization.

Table no. 5.44 also shows the ranks of each **Factors that normally influence organizations' EERP System** related statements which are used for assessment of better management tool after implementing EERP system. According to table, Decision making prefer to go for better management tool for EERP system and they gave **First** rank for it. Educational ERP system Planning is better management tool after implementing EERP system given the **second** rank. The motto behind implementing EERP system is to controlling planed activities so they gave **third** rank for it. After planning and controlling the activity we have to control the system which will help the decision taking authority to go for Directing and Analyzing the activities which has given **Fourth** rank for it.

Summary:

To take decision Staff make use of tools like Directing and Analyzing, Decision making, planning and controlling. The better management tools

provided through Educational ERP for the management are, Decision Making (Avg. Value 3.84), Planning (Avg. Value 3.74), Controlling (Avg. Value 3.68) and Directing and Analyzing (Avg. Value 3.66). The better management tools provided through Educational ERP are ranked using Average Value and preference of Usage.

5.4 comparison of cost with legacy system with existing ERP system

5.4.1 Cost of Legacy system

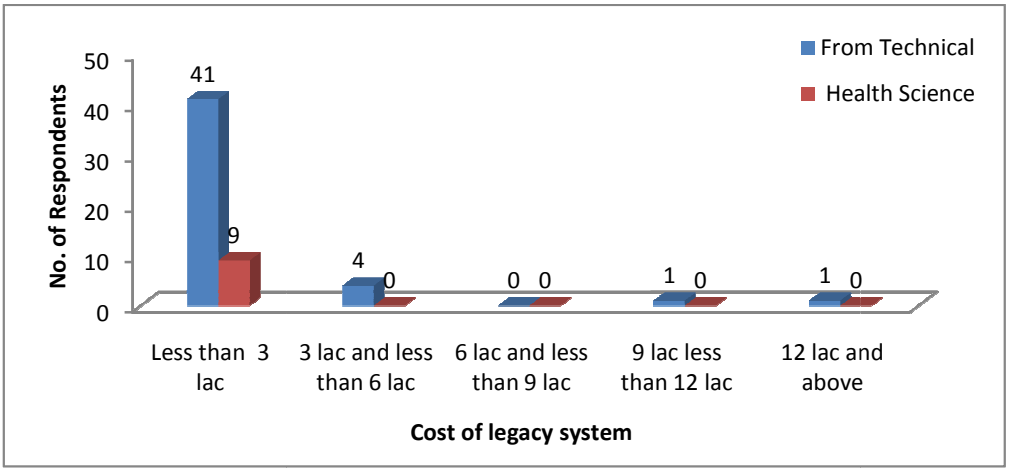
Table No. 5.45: Cost of legacy system before implementing Educational ERP system

Cost of Regular System (Before Implementing ERP)	No. of Respondents From Technical	No. of Respondents from Health Science
Less than 3 lac	41 (87.23)	9 (100)
3 lac and less than 6 lac	4 (8.51)	0
6 lac and less than 9 lac	0	0
9 lac less than 12 lac	1 (2.31)	0
12 lac and above	1 (2.31)	0
Total	**47**	**9**

Figures in bracket indicates Percentages

Table No. 5.45 shows the distribution of respondents from board of director/ management about cost of legacy system before implementing EERP system in Technical and Health Science Institutes. This table indicates the cost of regular system 87.23 percent respondents said that cost is less than 3 lac for Technical Institutes whereas 100 percent respondents said that cost is less than 3 lac for Health Science. Further 8.51 percent respondents said that cost is in between 3 lac and less than 6 lac. Further 2.31percent respondent said that cost is in between 9 lac less than 12 lac and 12 lac and above respectively for Technical Institutes. As all respondents from Health Science Institutes fall in the range less than 3 lac, therefore no any respondents for rest of cost range.

Graph 5.36:Cost of legacy system before implementing Educational ERP system



It is observed that the cost of legacy system i.e. traditional system before implementing EERP system. It is indicated in **Graph 5.36** that majority of the legacy system cost is less than 3 lac. The figure indicates that only Technical Institutes has spent cost on traditional system than the Health Science Institutes. As all respondents from Health Science Institutes fall in the range less than 3 lac, therefore no any respondents for rest of cost range.

5.4.1.1 Cost of Educational ERP Software

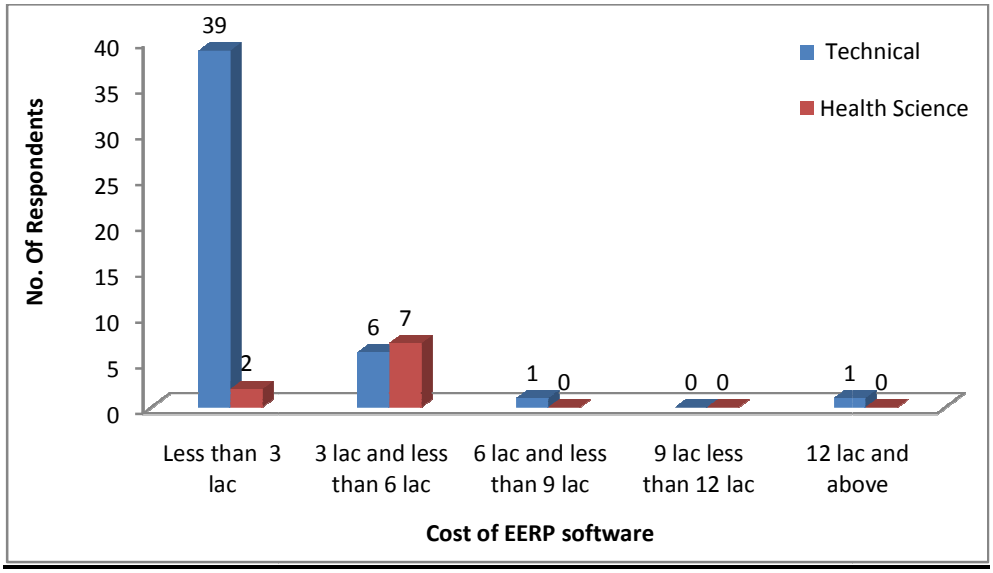
Table No. 5.46: Cost of Your Educational ERP software system

Cost of Educational ERP system	No. of Respondents From Technical	No. of Respondents from Health Science
Less than 3 lac	39 (82.98)	2 (22.22)
3 lac and less than 6 lac	6 (12.77)	7 (77.78)
6 lac and less than 9 lac	1 (2.13)	0
9 lac less than 12 lac	0	0
12 lac and above	1 (2.13)	0
Total	**47**	**9**

Table No. 5.46 shows the distribution of respondents from board of director/ management about cost of implementing EERP system in Technical and Health Science Institutes. This table indicates the cost of EERP software system 82.98 percent respondents said that cost is less than 3 lac for Technical Institutes whereas 22.22 percent respondents said that cost is less than 3 lac for Health Science. Further 12.77 percent respondents said that cost is in between

3 lac and less than 6 lac and 77.78 percent respondents said that cost is in between 3 lac and less than 6 lac . Further 2.13percent respondent said that cost is in between 6 lac less than 9 lac and 2.13 percent respondents said that cost of the EERP system is 12 lac and above for Technical Institutes. As all respondents from Health Science Institutes fall in the range less than 3 lac and 3 lac and less than 6 lac, therefore no any respondents for rest of cost range.

Graph 5.37: Cost of Your Educational ERP software system



It is indicated in **Graph 5.37** that majority of the EERP software system cost is less than 3 lac and 3 lac and less than 6 lac for Technical and Health Science Institutes. Therefore no any institutes in Pune District go for EERP system developed by MNC Company.

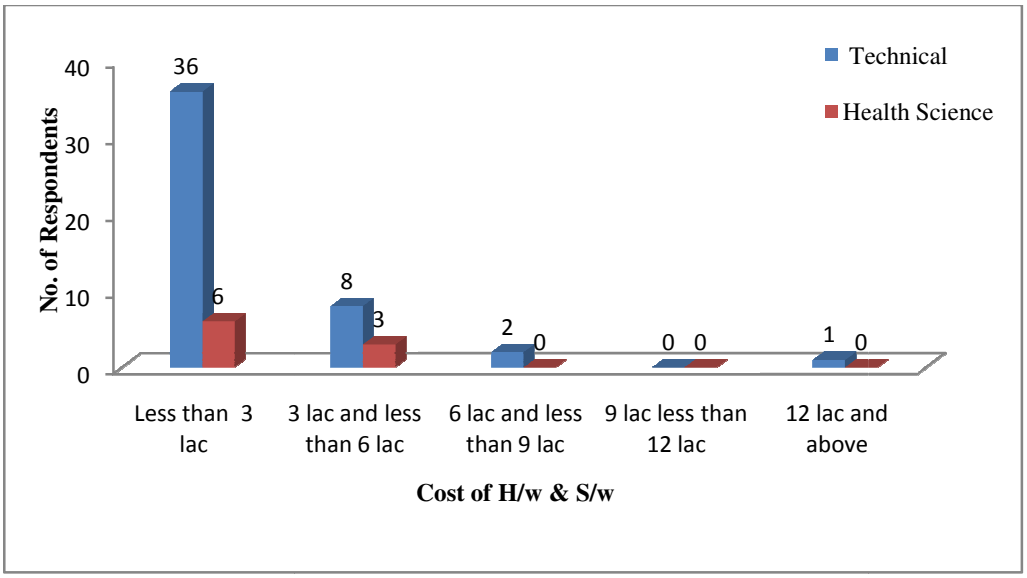
5.4.1.2 Cost of Hardware and software (Servers, desktop, storage, network, database, OS)

Table No. 5.47: Cost of Hardware and software

Cost of Hardware and Software	No. of Respondents From Technical	No. of Respondents from Health Science
Less than 3 lac	36 (76.60)	6 (66.67)
3 lac and less than 6 lac	8 (17.02)	3 (33.33)
6 lac and less than 9 lac	2 (4.26)	0
9 lac less than 12 lac	0	0
12 lac and above	1 (2.13)	0
Total	**47**	**9**

Table No. 5.47 shows the distribution of respondents from board of director/ management about cost of Hardware and Software in Technical and Health Science Institutes. This table indicates the cost of Hardware and Software, 76.60 percent respondents said that cost is less than 3 lac for Technical Institutes whereas 66.67 percent respondents said that cost is less than 3 lac for Health Science. Further 17.02 percent respondents said that cost is in between 3 lac and less than 6 lac and 33.33 percent respondents said that cost is in between 3 lac and less than 6 lac . Further 4.26 percent respondent said that cost is in between 6 lac less than 9 lac and 2.13 percent respondents said that cost is 12 lac and above for Technical Institutes. As all respondents from Health Science Institutes fall in the range less than 3 lac and 3 lac and less than 6 lac, therefore no any respondents for rest of cost range.

Graph 5.38: Cost of Hardware and software



It is indicated in **Graph 5.38** that majority of the cost of Hardware and Software are less than 3 lac and 3 lac and less than 6 lac for Technical and Health Science Institutes. Therefore no any institutes in Pune District think about higher range of software and Hardware for future up gradation of the EERP system.

Summary:

The majority of respondents from Board of Director / Management have positively respondent for the cost of legacy system less than 3 lac before

implementing Educational ERP system for Technical Institutes and 100 percent respondents from Health Science Institutes for the cost of legacy system less than 3 lac. The cost of Educational ERP are more than legacy system as the cost of Educational ERP software of Technical Institutes are Less than 3 lac (82.98 percent)whereas cost of Health Science is more than that of Technical Institutes which is 3 lac and less than 6 lac (77.78).Further the total cost of implementing Educational ERP system is equal to the cost of EERP system plus cost of hardware and software required to implement EERP system. So, the cost of hardware and software for majority of Technical and Health Science Institute is less than 3 lac(76.60 percent and 66.67 percent) and for Technical Institute cost more than above 6 lac. Therefore the cost of implementing Educational ERP system is more as compare to cost of legacy system before implementing EERP system.

5.4.1.3 Cost of Training and Maintenance

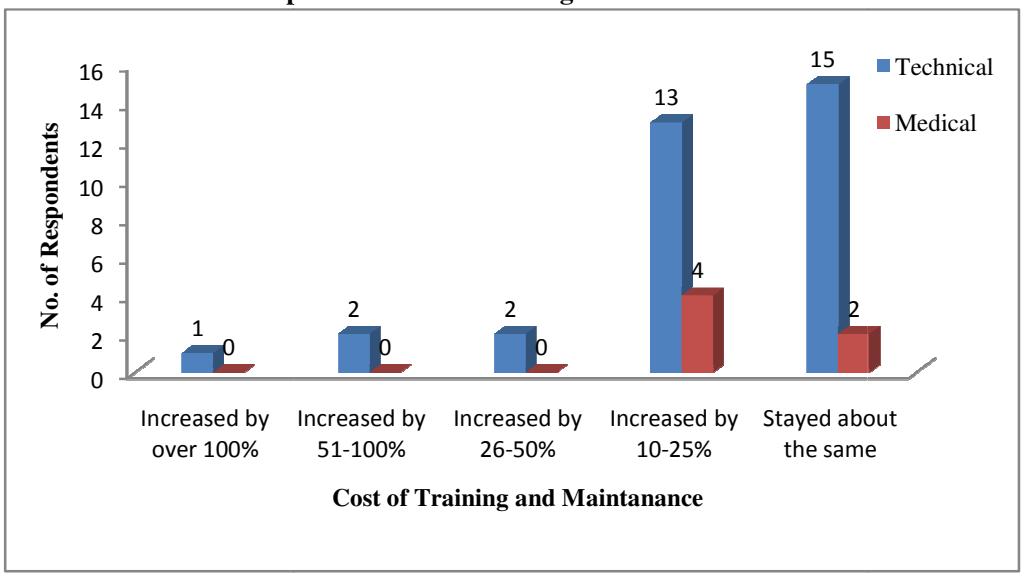
Table No. 5.48: Cost of training and Maintenance

Sr. No.	Cost of Training and Maintenance	Course				Total
		Technical		Health Science		
		Yes	%	Yes	%	
1	Increased by over 100%	1	3.03	0	0	**1**
2	Increased by 51-100%	2	6.06	0	0	**2**
3	Increased by 26-50%	2	6.06	0	0	**2**
4	Increased by 10-25%	13	39.39	4	66.67	**17**
5	Stayed about the same	15	45.45	2	33.33	**17**
	Total	**33**	**100**	**6**	**100**	**39**

Table No. 5.48 shows the distribution of respondents from board of director/ management about cost of training and maintenance in Technical and Health Science Institutes. This table indicates the cost of training and maintenance, 45.45 percent of respondents said that cost of training and maintenance stayed about the same for Technical Institutes whereas 33.33 percent respondents said that cost stayed about the same for Health Science Institutes. Further 39.39 percent and 66.67 percent respondents said that cost increased by 10-25 percent for Technical and Health Science Institute respectively. Whereas few

respondents said that cost of training and maintenance is increased by 26- 50 percent of the cost of Educational ERP system.

Graph 5.39: Cost of training and Maintenance



It is indicated in **Graph 5.39** that majority of the cost of training and maintenance has stayed about the same or increased by 10-25 percent. Therefore it means that Educational ERP system implemented duration is not more than 3 years. As number of years increases cost of training also gets increased.

Summary:

The majority of respondents cost of training and maintenance of Educational ERP system of Technical Institutes stayed about the same (45.45 percent) whereas for Health science cost of maintenance increased by 10-25 percent (66.67 percent) of the cost of Educational ERP system. Institutes should make sure that before implementing Educational ERP system they should check whether the business process are aligned with the goals of organization and with minimum customization as customization increases the cost of maintenance will also increase.

5.4.1.4 Cost Related Influencing Factors

Table No. 5.49:Educational ERP cost related influencing factors

Sr. No.	EERP cost related statements (Agree or Disagree)	No. of respondents					Total	avg value	Avg Value	Rank
		1	2	3	4	5				
1	Educational ERP system is less costly to enhance / upgrade than the system(s) that were replaced	0	1 (1.8)	10 (17.9)	39 (69.6)	6 (10.7)	56	3.89	3.93	**1**
2	Educational ERP systems is less costly to integrate than the system(s) that were replaced	0	5 (8.9)	16 (28.6)	26 (46.4)	9 (16.1)	56	3.70	3.88	**2**
3	Educational ERP system is less costly to maintain and operate the system(s) that were replaced	0	1 (1.8)	17 (30.4)	35 (62.5)	3 (5.4)	56	3.71	3.75	**3**

(Note:Average scale on 1 to 5 (where Strongly Disagree(SD) =1; Disagree (D) =2; Neutral(N) =3; Agree (A) =4; Strongly Agree(SA) = 5))

An attempt is made to assess the cost of **EERP System** implemented in organization related statements which can state to what extend respondents agree or disagree with the statements. Each item is measured on a five-point Likert Scale with strongly disagree allotted a score of 1 and strongly agree a score of 5 points as the extremities of the scale and asking them to rank their opinions. 1 and 2 points are very low response while 4 and 5 points in favor of delivery channel and which is user friendly. Point 3 represents neutrality between the two. From the responses of **Board of study / management**, average value is calculated with regard to each observation. These observations are then ranked on the basis of average value. As regards average value of cost related agree or disagree of the statements.

Table No. 5.49 shows the various statements for assessment the cost of EERP system **implemented in organization** related statements and their ranks. To meet the objective question is designed by using various statements which defines the level of statements related to factors which normally influence organizations' EERP System. It is observed that for each statement average scale is in-between 1 to 5 that is in-between strongly disagree to strongly agree.

It is seen that highest average value is 3.93 for Educational ERP system is less costly to enhance / upgrade than the system(s) that were replaced followed by average value 3.88 for Educational ERP systems is less costly to integrate than the system(s) that were replaced. Further average value 3.75 for Educational ERP system is less costly to maintain and operate the system(s) that were replaced.

Apart from these benefits it is observed that average value 3.93 which is above to the point neutral which means that still board of director / management has to decide on minimizing the cost which will neutralize the statement related to the cost. This will help more organization to implement EERP system if we keep the cost at neutral in likert scale.

Table no. 5.49 also shows the ranks of each cost of EERP system **implemented in organization** related statements which are used for assessment of agree or disagree to the statements. According to table, Educational ERP system is less costly to enhance / upgrade than the system(s) that were replaced prefer to go for cost of EERP system and they gave **First** rank for it. Educational ERP system Educational ERP systems are less costly to integrate than the system(s) that were replaced given the **Second** rank. Further the cost of EERP system are Educational ERP system is less costly to maintain and operate the system(s) that were replaced given the **Third** rank.

Summary:

To know about the cost of influencing factors of educational ERP system the respondents agreed to the statement are Educational ERP system is less costly to enhance / upgrade than the system(s) that were replaced (Avg. value is 3.93), Educational ERP systems is less costly to integrate than the system(s) that were replaced (Avg. value is 3.88) and Educational ERP system is less costly to maintain and operate the system(s) that were replaced (Avg. value is 3.75). The cost related influencing factor of Educational ERP system are ranked using Average Value and preference of respondents agreed to the cost related statement.

5.4.1.5Vendors

Table No. 5.50: ERP Vendors

Sr. No.	ERP Vendors
1.	Aarush Systems
2.	Acadmax
3.	Akshya Software pvt. Ltd
4.	Developed by IT Dept
5.	EDUSMART
6.	ETH (Digital Campus)
7.	GEMS
8.	GEN
9.	HP
10.	IBM Technology Pvt. Ltd.
11.	Jeeva
12.	Karishma
13.	Lakshya Software
14.	Net 2008
15.	Open Source
16.	Sigma Pvt. Ltd
17.	Softtech Pvt. ltd

Table No. 5.50 shows that the list of vendors those who provide EERP system to the organization which indicates the list of vendors given to choose to the respondents only few of them have been selected and rest all selected vendors according to their connivance (Local Vendors).

5.5 Parameters used for designing Framework of Educational ERP system

5.5.1 Infrastructure facility

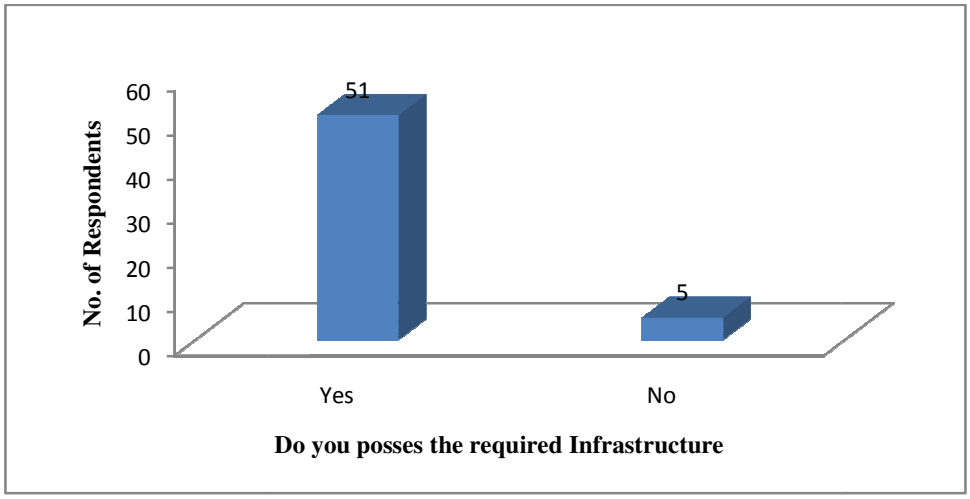
5.5.1.1 Required Infrastructure

Table No 5.51: Infrastructure facilities for implementing Educational ERP

Sr. No.	Statements	No. of respondents				Total
		Yes	%	No	%	
1	**Required Infrastructure for implementing EERP system**	51	91.1	5	8.9	56

Table No. 5.51 shows that out of 56 respondents 91.1 percent posses the required infrastructure facilities needed for implementing EERP system and 8.9 fails to get required infrastructure facilities needed for implementing EERP system.

Graph 5.40: Infrastructure facilities for implementing Educational ERP



As can be observed from the **Graph 5.40** majority of Technical and Health Science Institutes posses required infrastructure for implementing EERP system which is 99.1 percent and 8.9 fails to get required infrastructure facilities needed for implementing EERP system.

5.5.1.2 Parameters of required infrastructure facility

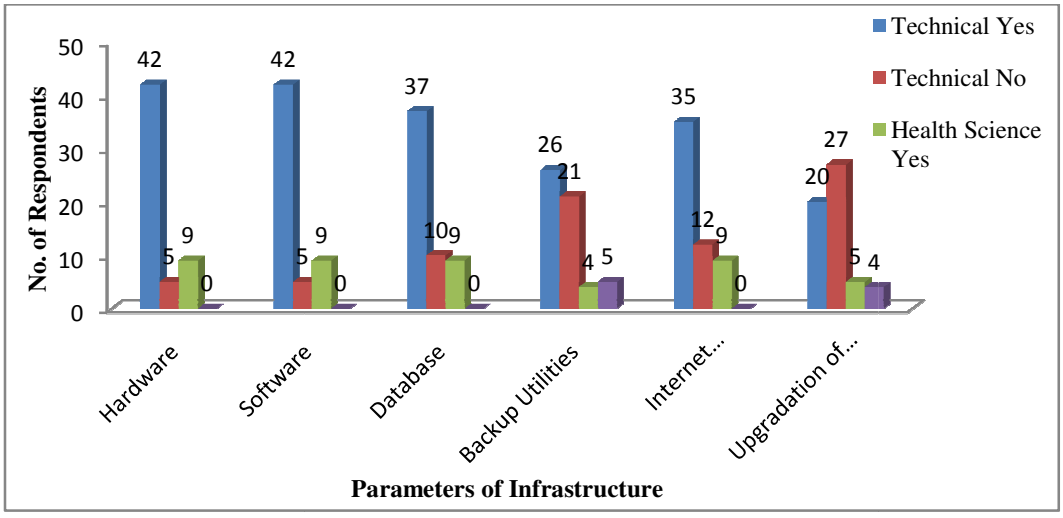
Table No 5.52: Parameters of Infrastructure facility

Sr. No.	Parameters	No. of respondents				Total
		Technical		Health Science		
		Yes	No	Yes	No	
1	Hardware	42 (89.36)	5 (10.64)	9 (100)	0	56
2	Software	42 (89.36)	5 (10.64)	9 (100)	0	56
3	Database	37 (78.72)	10 (21.28)	9 (100)	0	56
4	Backup Utilities	26 (55.32)	21 (44.68)	4 (44.44)	5 (55.56)	56
5	Internet Bandwidth	35 (74.47)	12 (25.53)	9 (100)	0	56
6	Upgradation of Educational ERP	20 (42.55)	27 (57.45)	5 (55.56)	4 (44.44)	56

Figures in bracket indicates Percentages

Table No. 5.52 represent the data collected from 56 respondents about required infrastructure for implementing EERP system in Technical and Health Science Institutes the parameters chosen are Hardware, Software, Database, Backup Utilities, Internet Bandwidth and Upgradation of EERP function in future. Out of total respondents 42 respondents have adequate Hardware Infrastructure for Technical and 9 respondents i.e. 100 percent Institutes have adequate Hardware Infrastructure for Health Science Institutes whereas 42 respondents have adequate Software for Technical and 9 respondents i.e. 100 percent Institutes have adequate Software for Health Science Institutes. Further 37 respondents have adequate Database for Technical and 9 respondents i.e. 100 percent Institutes have adequate Database for Health Science Institutes. Further 26 respondents have adequate **Backup Utilities** for Technical and 4 respondents have inadequate **Backup Utilities** for Health Science Institutes followed by 35 respondents have adequate internet bandwidth for Technical and 9 respondents i.e. 100 percent Institutes have adequate internet bandwidth for Health Science Institutes. The major problem area is upgradation of EERP system which has 20 respondents say they can upgrade the EERP system whereas 27 respondents say they don't upgrade the existing system because of Infrastructure for Technical Institutes and 5 respondents say they can upgrade the EERP system where as 4 respondents don't have adequate Infrastructure to upgrade the EERP system for Health Science Institutes.

Graph 5.41: Parameters of Infrastructure facility



Graph 5.41 represents the required infrastructure to implement EERP system are Hardware, Software, Database, Backup Utilities, Internet Bandwidth and upgradation of EERP system. The adequate infrastructure used by Institutes out of which 89.36 percent respondents have adequate Hardware infrastructure for Technical Institutes whereas 100 percent respondents have adequate Hardware infrastructure for Health Science Institutes followed by 89.36 percent respondents have adequate Software for Technical Institutes whereas 100 percent respondents have adequate Software for Health Science Institutes. Further 78.72 percent respondents have adequate Database for Technical Institutes whereas 100 percent respondents have adequate Database for Health Science Institutes. Further 55.32 percent respondents have backup utilities for Technical Institutes and 44.44 percent respondents have backup utilities for Health Science Institutes. For adequate infrastructure of Internet Bandwidth 74.47 percent respondents for Technical Institutes and 100 percent Internet Bandwidth for Health Science followed by major problem area is in up gradation of EERP system only 42.55 percent respondents have up gradation facilities for Technical Institutes and whereas 55.56 percent respondents have up gradation facilities for Health Science Institutes.

Summary:

The majority of Technical and Health Science Institutes respondents are satisfied with the infrastructure facility provided to Implement Educational ERP system (91.1 percent). The parameters of required infrastructure to Implement Educational ERP system are Hardware and Software which is 89.3 percent for Technical and 100 percent for Health Science Institutes. Further required parameter is Database is satisfied for both Technical (78.72 percent) and Health Science Institutes (100 percent). Followed by parameter Internet bandwidth is satisfied for Technical (74.47 percent) and Health Science Institutes (100 percent). The parameters which are not satisfied with the required infrastructure are Backup utilities for Health Science Institutes (44.44 percent) and up gradation of Educational ERP system for Technical Institutes (42.55 percent). Therefore the two parameters which are not satisfied for the required infrastructure are important to keep long term data with backup

utilities provided by Management and second parameter upgradation of Educational ERP system which will help to add on new policy / objective of organization to develop new business process for smooth functioning and getting desired MIS reports i.e compliance reports.

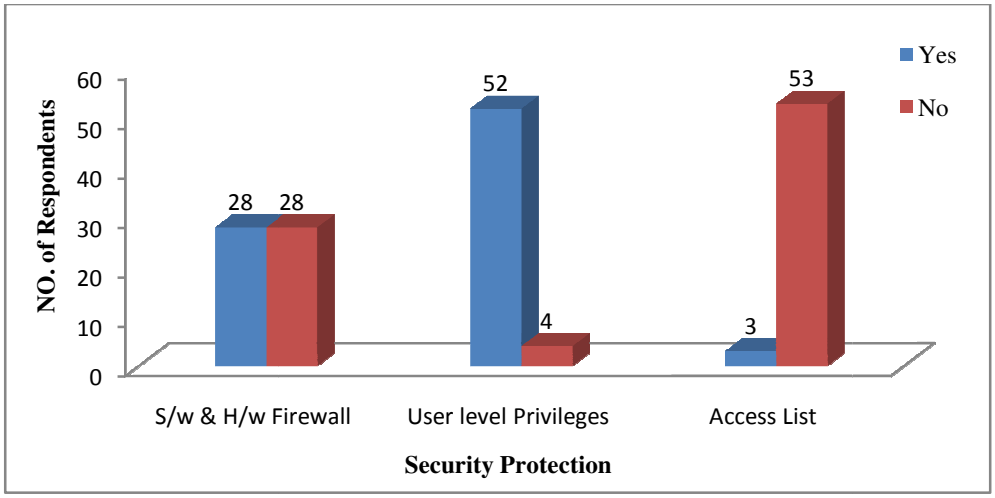
5.5.2 Security

Table No: 5.53: Security provided to protect Information

Sr. No.	Security Protection	No. of respondents				Total
		Yes	%	No	%	
1	S/w & H/w Firewall	28	50.0	28	50.0	56
2	User level Privileges	52	92.9	4	7.1	56
3	Access List	3	5.4	53	94.6	56

Table no 5.53 represents 50.0 percent respondents have answered in affirmative whereas 50.0 percent respondents have answered in negative for implementing security protection as S/w & H/w Firewall in EERP system, majority of organization i.e. 92.9 percent implemented EERP system has security protection as User level Privileges and negligible organization has implemented Access list as security protection.

Graph 5.42: Security provided to protect Information



Graph 5.42 clearly indicates most of the respondents i.e. 92.9 percent user level privileges go for the security protection. Further 50.0 percent respondents opt for S/W and H/W firewall. The response for access list is very low as compare to other security protection.

Summary:

The majority of respondents agreed to the security protection provided in Educational ERP system is User Level privileges (92.9 percent) as compare to the security protection provided through S/w and H/w Firewall (50.00 percent) and Access List (5.4 percent).

5.5.3 Reengineering of Educational ERP business processes

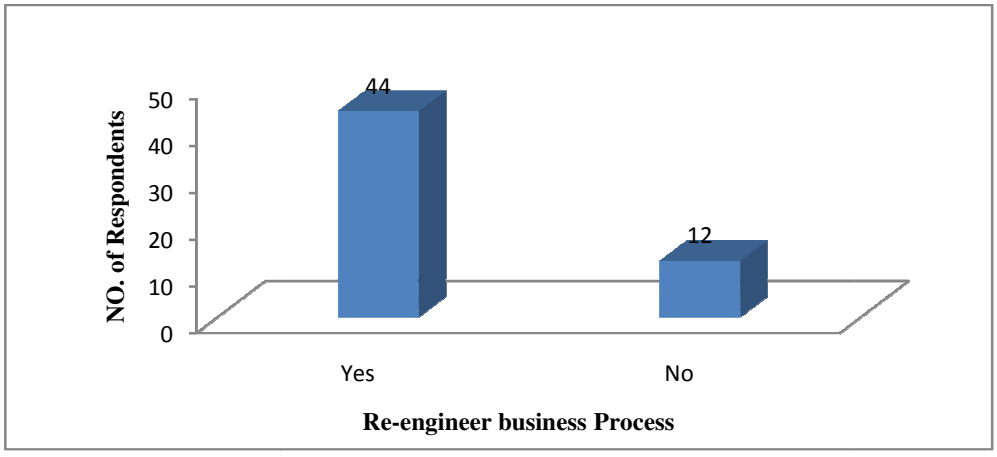
5.5.3.1 Business process re-engineering

Table No: 5.54: Business processes re-engineer of Educational ERP

Sr. No.	Business Process	No. of respondents				Total
		Yes	%	No	%	
1	**Re-engineer business process**	44	78.6	12	21.4	56

Table No 5.54 shows the distribution of business process re-engineering of EERP system to be implemented in organization as per importance of objectives specified by board of director / management. It is seen that 78.6 percent respondents agree for re-engineering of business process followed by 21.4 percent respondents don't request for business process re-engineering of EERP system.

Graph 5.43: Business processes re-engineer of Educational ERP



As can be observed from the **Graph 5.43**, most of the organization i.e. 78.6 percent organization request vendors to re-engineering the business process followed by 21.4 percent respondents implemented EERP system as standard package developed by vendors.

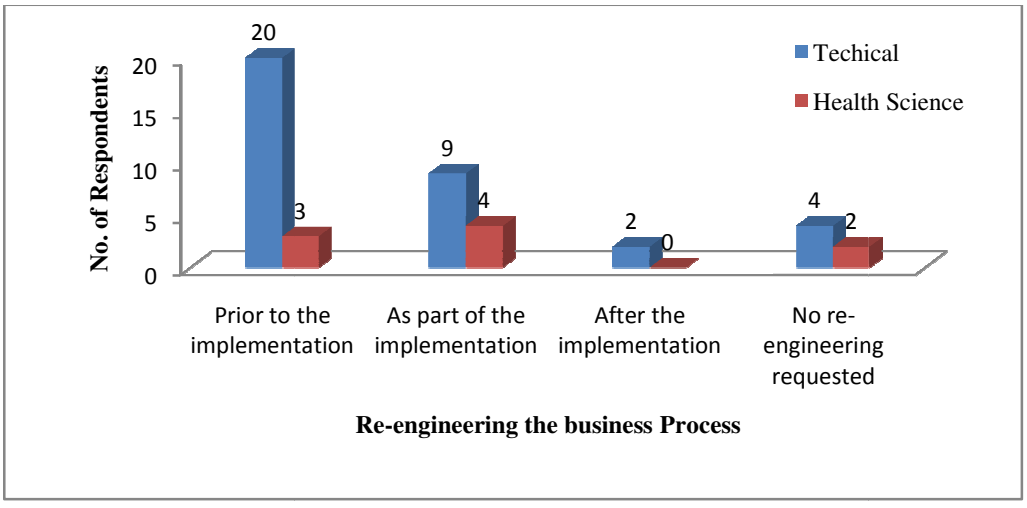
5.5.3.2 Request for business process re-engineering

Table No 5.55: Request for business processes re-engineering

Sr. No.	Re-engineering the business Process	No. of Respondents from Technical	No. of Respondents From Health Science
1	Prior to the implementation	20 (57.14)	3 (33.33)
2	As part of the implementation	9 (25.71)	4 (44.44)
3	After the implementation	2 (5.71)	0
4	No re-engineering requested	4 (11.43)	2 (22.22)
	Total	**35**	**9**

Table no. 5.55 shows the representation of data collected from 56 respondents out of which 47 respondents from Technical and 9 respondents from Health Science category. Business process re-engineering of EERP system requested by Institutes to the vendors are prior to the implementation, as part of the implementation, after the implementation and no re-engineering. 57.14 percent respondents request for business process re-engineering prior to the implementation for Technical and 33 percent respondents request for business process re-engineering for Health Science. Further 25.71 percent respondents request for business process re-engineering as part of the implementation for Technical and 44.44 percent respondents from Heath Science follow by only 5.71 percent respondents from Technical Institutes request after the implementation and only 11.43 percent respondents never request for business process re-engineering for Technical and 22.22 percent respondents from Health Science.

Graph 5.44: Request for business processes re-engineering



As can be observed from the **Graph 5.44**, most of the organization request vendors to reengineer the business process prior to the implementation and as part of the implementation for Technical and Health Science Institutes

Summary:

The majority of respondents from Technical and Health Science agreed for the business process re-engineering of Educational ERP system (78.60 percent). Out of 56 respondents 44 respondents agreed to change in the business process before and after implementation of Educational ERP system. The respondents of Technical Institutes request for business process re-engineering is prior to the implementation (57.14 percent) whereas only 33.33 percent from Health Science Institutes, As part of the implementation for technical is 25.71 and Health Science is 44.44 percent. There are some respondents they go for business process re-engineering after the implementation of Educational ERP system is 5.71 percent. Further 11.43 percent from Technical and 22.22 percent from Health Science don't request for any change in business process these Institutes go with standard package.

5.5.4 Access Controls

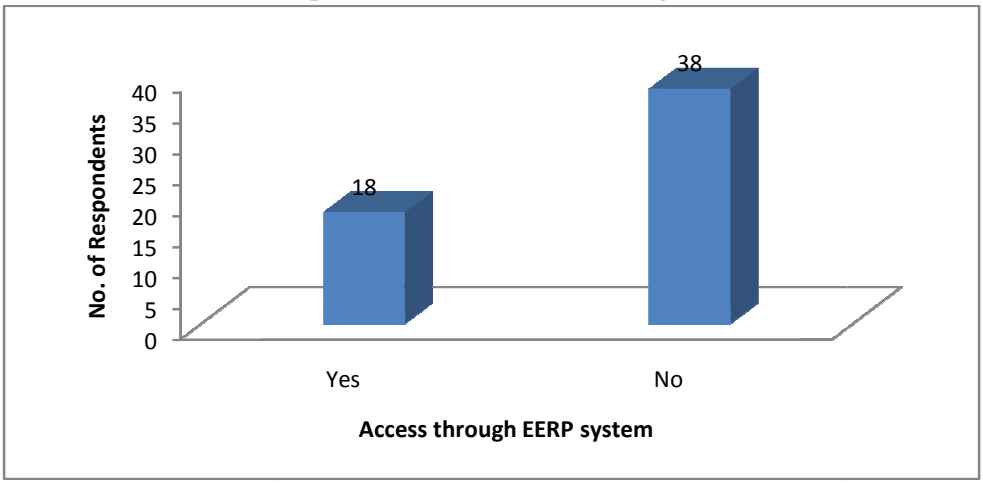
5.5.4.1 Access control Plug-in

Table No 5.56:Access control Plug – in

Sr. No.	Access through system	No. of respondents				Total
		Yes	%	No	%	
1	**Access control Plug-in for EERP System**	18	32.1	38	67.9	56

Table No 5.56 shows out of 56 respondent s only 32.1 percent respondents provide access control plug-in for EERP system followed by majority of respondents i.e. 67.9 percent EERP system don't have plug-in facility to access the information from third party service providers.

Graph 5.45: Access control Plug – in



As can be observed from **Graph 5.45** majority of the respondents don't have access control plug-in for EERP system i.e 67.9 percent followed by 32.1 percent organization has access control plug-in for EERP system to access information from third party service provider.

5.5.4.2 Types of Access control Plug-in used

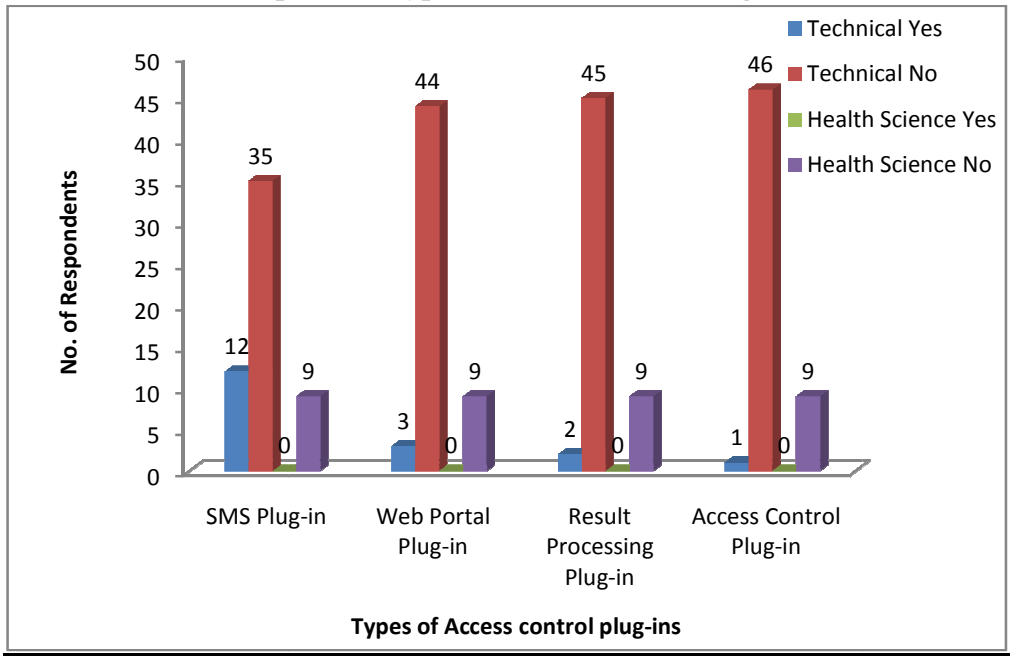
Table No 5.57: Types of Access control Plug-in

Sr. No.	Access control Plug-in	No. of respondents				Total
		Technical		Health Science		
		Yes	No	Yes	No	
1	SMS Plug-in	12 (25.53)	35 (74.47)	0	9 (100)	56
2	Web Portal Plug-in	3 (6.38)	44 (93.62)	0	9 (100)	56
3	Result Processing Plug-in	2 (4.26)	45 (95.74)	0	9 (100)	56
4	Access Control Plug-in	1 (2.13)	46 (97.87)	0	9 (100)	56

Figures in bracket indicates Percentages

Table no 5.57 shows out of 56 respondents only 18 respondents have access to plug-in and plug-out for other applications. Out of 18 respondents 25.53 percent respondents have access of SMS plug-in followed by 6.38 percent respondents have access of web portal plug-in. Further 4.26 percent respondents agree to have result processing plug-in and 2.13 percent respondents have access control plug-in to get rights of third party application. Whereas none of the respondents from Health Science Institute agree for accessing control plug-in.

Graph 5.46: Types of Access control Plug-in



As can be observed from **Graph 5.46** majorities of the respondent are not aware of the access control plug-ins can be used to transfer the information required by third party software.

Summary:

Least number of respondents agree for the Access control Plug-in which is 32.1 percent where this plug-ins can help to access and publish Information using access control plug-ins. The types of access control plug-in used by Technical are SMS Plug-in 25.53 percent, Web portal plug-in 6.38 percent, Result processing plug-in 4.26 percent and access control plug-in 2.13 whereas none of the access controls used by Health Science Institutes. This plug-ins can help to talk with educational ERP Information and extract to access or publish information.

5.6 Testing of Hypothesis

5.6.1 Hypothesis 1: Educational ERP leads to effective decision making in Educational Institutes.

Since the target respondents are varied in their nature / status / position / applicability which include Management, Staff and Learners, hence with the view to have a commonality about evaluation of each target respondents efforts have been made by researcher to classify the influencing factors of EERP system based on four common factors for all and remaining factors have been considered also so as to have the common inference and conclusion. Based on Table No. 5.29, 5.30 and 5.31 factors that normally influence many Organizations, the Likert Scale has been used by researcher to test the given hypothesis. To this researcher has identified competitive Eight influencing factors like Decision Making tools, Educational ERP system fulfill your objectives, Increased in productivity, Time Saving, Monitoring System or Dashboard, Record storage & archiving and retrieval, Efficient for inter-departmental coordination and Is the organization getting satisfactory Return On Investment for Management respondents. For Staff two influencing factors like Efficient for inter-departmental coordination and Is the organization getting satisfactory Return On Investment has been reduced as compare to Management respondents. For Learners two influencing factors like Increased in productivity and Record storage & archiving and retrieval has been reduced as compare to Staff respondents. Based on Table No. 5.29, 5.30 and 5.31 the given table has been made:

Table No 5.58: Factors influencing organizations EERP system

Sr. No.	Respondents	No. of Respondents					Total
		1	2	3	4	5	
1	Management	0	19	172	214	43	448
2	Staff	21	149	688	1114	344	2316
3	Learner	0	1	598	717	252	1568
Total		21	169	1458	2045	639	4332
Percentage		0.48%	3.90%	33.66%	47.21%	14.75%	

(Note: Average scale on 1 to 5 (where Strongly Disagree(SD) =1; Disagree (D) =2; Neutral (N) =3; Agree (A) =4; Strongly Agree (SA) = 5))

The percentile test has been used for Table No. 5.58. From this table ranking given by all respondents is either strongly agree (14.75%) or agree (47.21%) or neutral (33.66%), where as very few respondents reported there is no influence of EERP in decision making which is negligible (4.38%). The Percentile test has been used to test the hypothesis**.** However the percentile clear cut indicates that the majority respondents are in favor and showing positive impact on effective decision making (61.96%) even though we have not considered the neutral (33.66%). Therefore, it is inferred that there is positive impact on board of director/ Management, Staff and Learners which leads to acceptance of hypothesis "**EERP leads to effective decision making in Educational Institutes**".

5.6.2 Hypothesis 2: Infrastructure facility is inadequate for implementing ERP in Educational Institutes.

Step 1: Setting Hypothesis.

H0 Null Hypothesis: 91% or more Educational Institutes have adequate infrastructure facility for implementing Educational ERP system. (H0: p = .91)

H1 Alternate Hypothesis: < 91% Educational Institutes have inadequate infrastructure facility for implementing Educational ERP system. (H1= p < .91)

H0 : p =0.91

H1= p < 0.91 (One tail test as rejection area is towards one side)

Step II: Sample Size

n=56 (> 30)

As n > 30, large sample test i.e. Z-test is used.

Table 5.48: Required Infrastructure for implementing EERP system

Sr. No	Required Infrastructure	No. of Respondents
1	Yes	51 (91.1)
2	No	5 (8.9)
	Total	56 (100)

Step III: Calculation of S.E. (Standard Error)

$S.E=\sqrt{pq/n}$ Where p = 91

q = 100-p = 9

n =56

S.E. = $\sqrt{91 * 9 / 56}$= **0.5110**

Step IV: Calculation of Z value

Z= diff. / S.E.

Z_{cal}= 0.1/0.5110

=0.1956

Step V: Comparison:

Table value of Z for one tail test at 5% level of significance is 1.64

Step VI: Conclusion:

Calculated value of Z (**0.1956**) < Table value of Z (1.64) hence we accept H0 and reject H1. It means that **hypothesis of the study** "Infrastructure facility is inadequate for implementing ERP in Educational Institutes" **is rejected.**

Respondents	Sample size	Proportion	Standard error	z - statistic
Board of Director / Management	56	0.911	**0.5110**	**0.0068376**

For implementation of Educational ERP, various parameter are considered like Hardware, Software, Database, Backup Utilities, Internet Bandwidth and Upgradation of Educational ERP.As per the primary data all parameters have more than 50 Percent Institutes have adequate infrastructure facility for implementing Educational ERP system, hence this data again support null hypothesis hence reject alternative hypothesis.

5.6.3 <u>Hypothesis 3:</u> Educational ERP are very much cost effective as compared to legacy system

Step 1: Setting Hypothesis.

H0: The cost of implementing legacy system is equal to the cost of implementing Educational ERP system. (H0: X1=X2)

H1: **Educational ERP are very much cost effective as compared to legacy system**. (H1: X2>X1)

H0: X1=X2

H1: X2>X1

Step II: Sample Size

n1=56 (> 30)

n2=56 (> 30)

As n > 30, large sample test i.e. Z-test is used.

Step III: Calculation of Mean and S.D. of regular system and EERP system (X1 & X2)

System Type	Mean of cost of Regular and ERP system	Standard Deviation
Legacy System	2.09	2.566
EERP System	5.04	5.742

Step IV: Calculation of S.E. (Standard Error)

S.E= 0.8403

Step V: Calculation of Z value.

Z= diff. / S.E.

Z= 4.177

Step V: Comparison:

Table value of Z statistics for one tail test at 5% level of significance is 1.64.

Step VI: Conclusion:

Z statistics of the comparison of the Legacy system and EERP system is 4.177 which is greater than 1.64 hence reject the null hypothesis "The cost of implementing legacy system is equal to the cost of implementing Educational ERP system" and **accept the alternative hypothesis of the study that is "Educational ERP are very much cost effective as compared to legacy system"** at 5% level of significance.

CHAPTER 6
FINDINGS, SUGGESTIONS AND SCOPE FOR FURTHER RESEARCH

6.0. Introduction

This chapter first presents the important findings of the study. Next, the conclusion and suggestions arising out of the study are presented. It was observed during the course of the study that published research material on the subject of the study was strictly limited and a number of areas and aspects require wider and in-depth research in future. The scope for further research is therefore briefly discussed before concluding the chapter. For ready reference and convenience, referent table numbers of the study are given in brackets in the concerned paragraph of the chapter.

6.1. Findings: Perceptions regarding Educational ERP system

The findings set forth in the following pages constitute a recapitulation in a short form, of what has been attempted at length in earlier chapters. This study mainly relates to the period of Implementation of ERP in Educational Institutes, Educational ERP modules, Training and duration of training provided, Factors influence to implement EERP system, Mode of communication , IT up gradation policy, Security Levels implemented on Application , Vendors Recovery Action and duration of Solving problem / Bug, Feedback and frequency of Feedback taken, Pre and prior Customization of Educational ERP system , User Interface and Performance of Educational ERP system, Usages of Educational ERP System, Educational ERP Provide better management tools, Cost of Legacy system, Cost of Your Educational ERP software system and Cost of Hardware and software, Vendors providing Educational ERP system, Cost of Training and Maintenance and Cost Related Influencing Factors, Infrastructure and Parameters of required infrastructure facility for implementing Educational ERP system, Business process re-engineering and request for business process re-engineering and Access Controls and types of Access control Plug-in used. Five objectives and three hypotheses lay primary emphasis on this subject. The researcher of this study

has considered it necessary and useful to also look at the implementation of Educational ERP system at national and international level. This unique approach has provided new insights, added to the important conclusions and enriched this study.

The researcher has analyzed the primary data to study the awareness of Educational ERP system implemented in Technical and Health Science Institutes and the ease of work after implementing for Board of Directors, Staff and Learners and to suggest remedial measures. The researcher has done the assessment of Educational ERP system according to the Board of Directors/ Management, Staff and Learners point of view and measured the efficiency at work place after implementing Educational ERP system in Pune District. The view point of Board of Directors / Management, Staff and Learners about the usage of Educational ERP system opinions is presented and based on analysis of the primary data is presented in three parts, part I - Board of Directors / Management part II- Staff and part III - Learners.

6.1.1 Part I - Board of Directors / Management

The Board of Directors / Management is one who takes decision whether to implement Educational ERP system in Technical and Health Science Institutes which will help them to streamline the processes as per the goals and objective of the Institute. The Board of Director / Management has made an effort to benchmark the business processes of Educational ERP andperiod of Implementation of EERP in Educational Institutes, Educational ERP modules, Training and duration of training provided, Factors influence to implement EERP system, Mode of communication , IT up gradation policy, Security Levels implemented on Application , Vendors Recovery Action and duration of Solving problem / Bug, Feedback and frequency of Feedback taken, Pre and prior Customization of Educational ERP system , User Interface and Performance of Educational ERP system, Usages of Educational ERP System, Educational ERP Provide better management tools, Cost of Legacy system, Cost of Your Educational ERP software system and Cost of Hardware and software, Vendors providing Educational ERP system, Cost of Training and Maintenance and Cost Related Influencing Factors, Infrastructure and Parameters of required infrastructure facility for implementing Educational

ERP system, Business process re-engineering and request for business process re-engineering and Access Controls and types of Access control Plug-in used.

- As compared to the Technical and Medical Institutes implementing Educational ERP in Institutes, majority of Technical Institutes are implemented EERP system which is 65.96 percent for the period of less than one year. The period of implementing EERP system is not more than three years. *(Table No. 5.2)*
- It is observed that more than 50.00 percent of Institutes have implemented Educational ERP modules are Admin, Students, Admission, Library Management, Fee Collection, Staff, Placement, Alumni and Examination. Out of 25 modules only 9 modules implemented and remaining 16 modules have not been utilized by Technical and Health Science Institutes which may cause to get the compliance reports / MIS reports to take any decision. *(Table No. 5.3)*
- It is found that Board of Directors / Management of Technical and Health Science provide training to staff and Learners which is 70.21 percent and 66.67 percent respectively but the duration of training given is not more than two days is 42.42 percent for technical Institutes whereas zero percent for Health Science.*(Table No. 5.4 and Table No. 5.5)*
- Factors that influence Board of Directors / Management to implement Educational ERP system by ranking parameters like 87.5 percent for "Transform the way the institute operates", 85.7 percent for "To Increase efficiency" 85.7 percent for "Provide better management tools" and 85.7 percent for "Keep organization competitive". (Table No. 5.10)
- Mode of communication implemented in Educational ERP system and made usage from SMS, E-mail and Alert is E-mail which is 95.74 percent for Technical and 100 percent for Health Science Institutes.(Table No. 5.11)
- 60.70 percent Board of Directors / Management have IT up gradation policy in place to upgrade the existing system / hardware configuration. This will keep organization to increase efficiency, provide better management tools, improve services for users and modernize the campus with IT environment. (Table No. 5.14)

- It is found that 92.90 percent Educational ERP system provide User level Privileges security for protecting Information. (Table No: 5.15)
- It is observed that70.21 percent are satisfied with the vendor recovery action with Technical Institutes whereas 33.33 percent with Health Science, 80.5 percent are satisfied with duration of solving problem / bug fixing with one week.(Table No. 18 and Table No. 5.21)
- Board of Directors / Management take feedback of Staff is 59.89 percent for Technical Institutes and 8.11 percent for Health Science Institutes. Feedback taken of Learners is 30.83 percent for Technical and 50.00 percent are satisfied about taking feedback on EERP system. (Table No. 5.24 and Table No. 5.25)
- Duration of taking feedback 57.1 percent before three months for Staff and 85.00 percent of Learner feedback duration is above 4 months. (Table No. 5.26 and Table No. 5.27)
- It is found that 87.5 percent request vendors to do customization as per requirement whereas only 12.5 percent don't request for customization they go for standard package. (Table No. 5.28)
- Factors that normally influence Board of Directors / Management with highest average value is 3.96 for "Decision Making tools", average value 3.91 for "Educational ERP system fulfill your objectives" and average value 3.75 for "Increase in productivity". (Table No. 5.29)
- The least priority is given to Return On Investment (ROI) with average value of 3.46 which is last in ranking. (Table No. 5.29)
- It is found that 61.71 percent are satisfied with Educational ERP system user interface from Technical and 55.56 percent users from Health Science (Table No. 5.32)
- The usages utilized by Board of Directors / Management of Educational ERP system are 67.5 percent for "News / Events information", 66.1 percent for "Exam Date Information and Admission Confirmations" and 62.5 percent for "Placement schedules / selection / cancellation". The least response for usage is given to Daily attendance of students for parents (auto generated) which is 7.1 percent. (Table No. 5.35)

- It is observed that only 46.81 percent of Technical Institutes users are somewhat or highly satisfied with the performance of the EERP system whereas only 11.11 percent of users from Health Science Institutes. (Table No. 5.37)
- Reasons of dis-satisfaction due to performance of Educational ERP system of Health Science are more as compare to Technical Institutes due to not aligned with the business process, lack of maintenance support and MIS reports are not satisfied. (Table No. 5.40)
- Utilization of better management tools from Educational ERP system are with highest average value is 4.25 for "Directing and Analyzing", average value 3.91 for "Decision Making", average value 3.57 for "Planning" and average value 3.09 for "Controlling". (Table No. 5.43)
- 87.23 percent Technical institutes cost of legacy system is less than 3 lacs whereas 100 percent Health Science institutes cost of legacy system is less than 3 lacs. (Table No. 5.45)
- It is found that 82.98 percent of Technical Institutes implementing Educational ERP software system cost is less than 3 lacs and 77.78 percent of Health Science Institutes implementing Educational ERP system cost is in between 3 lacs and less than 6 lacs. (Table No. 5.46)
- 76.60 percent of Technical Institutes are agreed to the cost of Hardware and Software is less than 3 lacs whereas 66.67 percent Health Science Institutes agreed to the cost which is less than 3 lacs. (Table No. 5.47)
- It is observed that Cost of training and maintenance after implementing Educational ERP system for Technical Institutes is 45.45 percent stayed about the same and 39.39 percent agreed to increase by 10-25 percent whereas for Health Science Institutes 33.33 percent stayed about the same and 66.67 percent said to have increase by 10-25 percent cost of training and maintenance. (Table No. 5.48)
- Cost related factors which influence Institutes to implement educational ERP system which are agreed with highest average value 3.93 for "Educational ERP system is less costly to enhance / upgrade than the system(s) that were replaced", average value 3.88 for "Educational ERP systems is less costly to integrate than the system(s) that were replaced"

and average value 3.75 'Educational ERP system is less costly to maintain and operate the system(s) that were replaced". (Table No. 5.49)

- 91.10 percent Technical and Health Science Institutes have required infrastructure for implementing EERP system. The Parameters of Infrastructure facility with less importance given by board of director are for Backup Utilities 55.32 percent for Technical Institutes and 44.44 percent Health Science Institutes whereas Upgradation of Educational ERP 42.55 percent for Technical and 55.56 percent for Health Science Institutes. (Table No. 5.52)
- 78.6 percent from Technical and Health Science Institutes agreed for Business processes re-engineer of Educational ERP. 57.14 percent of Technical Institutes requested for request for business process re-engineering is "Prior to the implementation" whereas 44.44 percent of Health Science Institutes request for business process re-engineering is "As part of the implementation" and "No re-engineering requested" done by Technical Institutes are 11.43 percent and 22.22 percent from Health Science Institutes. (Table No. 5.54 and Table No. 5.55)
- It is found that 32.1 percent Technical and Health Science Institutes agreed for access control plug-ins. (Table No. 5.56)
- The types of access control plug-in used by Technical are SMS Plug-in 25.53 percent, Web portal plug-in 6.38 percent, Result processing plug-in 4.26 percent and access control plug-in 2.13 whereas none of the access controls used by Health Science Institutes. (Table No. 5.57)

6.1.2 Part II: Staff

All the Staff of Educational Institutes of Technical and Health Science are using Educational ERP system to communicate and take decision about the progress of Learners and improvement in teaching process by implementing Educational ERP modules, Training and duration of training provided, Mode of communication, Security Levels implemented on Application, Vendors Recovery Action and duration of Solving problem / Bug, Feedback and frequency of Feedback taken, User Interface and Performance of Educational ERP system and Usages of Educational ERP System. The effectiveness and

efficiency of operations of educational institutions would significantly improve for the staff after implementing Educational ERP system.

- It is found that Staff of Technical and Health Science provide training to staff which is 63.90 percent and 54.05 percent respectively but the duration of training given is not more than one day is 78.92 percent for technical Institutes whereas 100 percent for Health Science. The duration of training given to Technical Institutes for two days and more is not more than 21.08 percent. (Table No. 5.6 and Table No. 5.7)
- Mode of communication implemented in Educational ERP system and made usage from SMS, E-mail and Alert is E-mail which is 98.28 percent for Technical and 100 percent for Health Science Institutes.(Table No. 5.12)
- It is found that 79.50 percent Educational ERP system provide User level Privileges security for protecting Information as compare to S/w and H/w Firewall (55.40 percent) and Access List (22.3 percent). (Table No: 5.16)
- It is observed that73.35 percent are satisfied with the vendor recovery action with Technical Institutes whereas 8.11 percent with Health Science, 73.4 percent are satisfied with duration of solving problem / bug fixing with one week.(Table No. 19 and Table No. 5.22)
- It is found that feedback of Staff taken by Board of Directors on Educational ERP system is 59.89 percent for Technical Institutes and 8.11 percent for Health Science Institutes. (Table No. 5.24)
- Duration of feedback taken from Staff on Educational ERP system is 57.1 percent before three months whereas 42.9 percent staff feedback on Educational ERP system is taken after four months. (Table No. 5.26)
- Factors that normally influence Staff with highest average value is 3.94 for “Educational ERP system fulfill your objectives”, average value 3.92 for “Decision Making tools” and average value 3.88 for “Time saving”. (Table No. 5.30)
- It is found that 62.76 percent are satisfied with Educational ERP system user interface from Technical and 59.46 percent users from Health Science (Table No. 5.33)

- It is observed that only 58.46 percent of Technical Institutes users are somewhat or highly satisfied with the performance of the EERP system whereas 62.16 percent of users from Health Science Institutes are satisfied with the performance of Educational ERP system. (Table No. 5.38)
- Reasons of dis-satisfaction due to performance of Educational ERP system of Health Science are more as compared to Technical Institutes due to not aligned with the business process, lack of maintenance support and MIS reports are not satisfied. (Table No. 5.41)

6.1.3 Part III: Learners

All the Learners of Educational Institutes of Technical and Health Science are using Educational ERP system. The effectiveness and efficiency of operations of educational institutions would significantly improve for the Learners after implementing Educational ERP system which wills improve to communicate and take decision about the progress of Learners by implementing Educational ERP modules, Training and duration of training provided, Mode of communication, Security Levels implemented on Application, Vendors Recovery Action and duration of Solving problem / Bug, Feedback and frequency of Feedback taken, User Interface and Performance of Educational ERP system and Usages of Educational ERP System.

- It is found that Staff of Technical and Health Science provide training to Learners which is 87.22 percent and 100 percent respectively but the duration of training given is not more than one day is 64.65 percent for technical Institutes whereas 50.00 percent for Health Science. The duration of training given to Technical Institutes for two days and more is not more than 35.35 percent and for Health Science Institutes for two days and more is 50.00 percent. (Table No. 5.8 and Table No. 5.9)
- Mode of communication implemented in Educational ERP system and made usage from SMS, E-mail and Alert is E-mail which is 100 percent for both Technical and Health Science Institutes.(Table No. 5.13)

- It is found that 100 percent Educational ERP system provide User level Privileges security for protecting Information as compare to S/w and H/w Firewall (25.50 percent) and Access List (3.60 percent). (Table No: 5.17)
- It is observed that62.78 percent are satisfied with the vendor recovery action with Technical Institutes whereas 56.25 percent with Health Science, 82.32 percent are satisfied with duration of solving problem / bug fixing with one week.(Table No. 20 and Table No. 5.23)
- It is found that feedback of Learners taken by Board of Directors on Educational ERP system is 30.83 percent for Technical Institutes and 50.00 percent for Health Science Institutes. (Table No. 5.25)
- Duration of feedback taken from Learners on Educational ERP system is 15.00 percent before three months whereas 85.00 percent Learner feedback on Educational ERP system is taken after four months. (Table No. 5.26)
- Factors that normally influence Staff with highest average value is 4.06 for "Educational ERP system fulfill your objectives", average value 3.90 for "Decision Making tools" average value 3.62 for "Time saving" and average value 3.53 for "Monitoring System or Dashboard". (Table No. 5.31)
- It is found that 39.44 percent are satisfied with Educational ERP system user interface from Technical and 28.13 percent users from Health Science (Table No. 5.34)
- It is observed that only 48.89 percent of Technical Institutes users are somewhat or highly satisfied with the performance of the EERP system whereas 53.13 percent of users from Health Science Institutes are satisfied with the performance of Educational ERP system. (Table No. 5.39)
- Reasons of dis-satisfaction due to performance of Educational ERP system of Health Science are more as compared to Technical Institutes. It is found that 40.45 percent learner agreed that Educational ERP system are Not aligned with the business process whereas 54.55 percent learners from Health science are agreed for Not aligned with the business process. (Table No. 5.42)

6.2 Conclusion

- As compared to the Technical and Medical Institutes implementing Educational ERP in Institutes majority of Technical Institutes are implemented Educational ERP system for the period of less than one year. The period of implementing Educational ERP system is not more than three years looking at the data which has been collected.
- The majority of the Technical and Health Science Institutes have implemented Educational ERP modules are Admin, Students, Admission, Library Management, Fee Collection, Staff, Placement, Alumni and Examination. It is found that majority of the modules have not been utilized and implemented by Institutes which may cause to get the compliance reports / MIS reports to take any decision.
- The training required on Educational ERP is more for Health Science Institute Staff and Learners as Compare to Technical Institutes and the duration of training given to Staff and Learner is not more than one day which should be increased for more number of days.
- The majority of respondents from Technical and Health Science Institutes wants change in the organization with the factors that influence the management to implement Educational ERP are transform the way the Institutes Operates, increase efficiency, provide better management tools and keep organization competitive. The factors which have given least priority are Improve services for management, faculties and students and Enhance accountability / regulatory compliance.
- The majority of respondents from Technical and Health Science Institutes make use of Mode of communication as E-mail from the Board of Director / Management, Staff and Learner whereas only few respondents make use of SMS and Alert as mode of communication.
- The Board of Directors of the Technical and Health Science Institutes have IT Upgradation policy in the organization which will help to upgrade the existing system or to adopt new functionalities in Educational ERP as per upcoming Technology.
- The security provided to Technical and Health science Institutes with Educational ERP system is user level privileges agreed by Board of

Directors, Staff and Learners as compare to other security protection like S/w and H/w Firewall and Access list.

- The recovery action provided from management to staff and Learners as compared to Health Science is more for Technical Institutes. Therefore the problem solving capacity from vendors should be provided to Health Science Institutes and make aware of the Educational ERP system.
- Least number of respondents from Board of Directors, Staff and Learners are satisfied from Technical and Health Science Institutes for duration of solving the problems of Educational ERP within 24 hours from vendors. The board of director should take note and put clause in the agreement of solving the problem within 24 hours or provide 365 * 24 hours service engineering.
- Feedback taken by Board of Directors of Staff and Learners about Education ERP system for Technical Institutes is not more than 60 percent as compared to only 50 percent feedback is taken of staff and Learner is taken from Health Science Institutes.
- The duration of taking feedback by Board of Directors / Management from Staff and Learners is 4 months to 6 months in Technical and Health Science Institutes.
- The majority of Institutes from Technical and Health Science goes for customization of Educational ERP system as compare to standardize package.
- The User Interface designed for the operation of Educational ERP system is not user friendly, the system interface for Learners is unfriendly as compare to Management and Staff.
- The Board of Directors from Technical Institutes are less satisfied than that of Health Science Institutes, whereas Staff and Learners are more satisfied with the performance of Educational ERP system. Therefore, the Staff and Learners from Technical Institutes are more Technical Savvy than that of Learners from Health Science Institutes.
- The Board of Directors and Learners from Technical and Health Science are dis-satisfied of Educational ERP system performance due to Not aligned with the business process, MIS reports are not satisfactory and

Lack of maintenance support whereas Staffs from Technical and Health Science Institutes are satisfied with the performance of Educational ERP system.

- The cost of implementing Educational ERP system in Technical and Institutes is more as compare to cost of legacy system before implementing Educational ERP system.
- Institutes should make sure that before implementing Educational ERP system they should check whether the business process are aligned with the Objectives / goals of organization and with minimum customization as customization increases the cost of maintenance will also increase.
- The cost of influencing factors of educational ERP system Board of Directors agreed to the statement is Educational ERP system is less costly to enhance / upgrade than the system(s) that were replaced.
- The board of director of Technical and Health Science Institutes are satisfied with the infrastructure facility provided to implement Educational ERP system.
- The required infrastructure to implement Educational ERP system are Hardware, Software, Database, Backup Utilities, Internet Bandwidth and upgradation of EERP out of which two parameters of required infrastructure are not satisfied are backup utilities which will keep data for long term and upgradation of Educational ERP which helps to add on new policy / objective of organization to develop new business process for smooth functioning and getting desired MIS reports i.e. compliance reports.
- The Board of Directors of Technical and Health Science Institutes are agreed for the business process re-engineering of Educational ERP system. Therefore more no of board of director request for the customization rather than going for standardized package.
- Only few Institutes from Technical and Health Science knows about the plug-ins to access and/or publish information in desired output.

6.3. Suggestions

For the success of an Educational ERP in Technical and Health Science Institutes the Institutes and vendors should come up with and new invention and benchmark the business processes which will help Board of Directors, Staff, Learners, Parents and Industry to take decision with compliance reports. The overall architecture of Educational ERP should be robust and scalable to adopt the changing environment. The Educational ERP emerging should be successful and inter operable which will suite the requirement of Technical and Health Science Institutes. Following are some suggestion for the successful implementation of Educational ERP system in Institutes.

- **Utilization of Educational ERP modules:** There should be plan which will help Institutes to implement the modules in phase wise which are dependent with each other. The clear understanding of which modules should be implemented in which phase should be studied by the authority persons from the vendor and then plan. This will help the institute to get better results and Educational ERP can be implemented successfully in Technical and Health Science Institutes.
- **Increase number of training sessions:** There should be planned training programs to orient Board of director, Staff, Learners, Parents and Industry for using Educational ERP very effectively and efficiently. Without adequate and timely training Educational ERP system are likely to fail no matter how much the investment.
- **Make plans for reliable maintenance:** There should be a facility to have 24*7 days immediate maintenance, without which critical Educational ERP System should not be undertaken. It is also vital to maintain the confidence of the users. The maintenance work should be ideally given to the vendor as they know the system processes and infrastructure.
- **Backup Utility:** There should be backup utility devices which will store and keep as back file through scheduling backup plan which will help institute in case of disaster management.
- **Make plan of reliable Infrastructure:** There should be reliable infrastructure which will help in security and scalable to new application implementation with existing infrastructure. Both H/w and S/w level

security should be maintained with application authorization and authentication information security.

- **Continuous Feedback:** Feedback is the process of gathering the inputs from users. The process of feedback actually starts at the conceptualization of the application which will focus mainly on the mission and objective statements of Technical and Health Science Institutes. Initially, it will be comments / observations on documents / reports that are prepared. At a later stage it will be the actual experience on the Educational ERP system and at the final stage it will reflect with streamline / benchmark the business process which will make stakeholders satisfaction/dissatisfaction. The feedback cycle once started has to be maintained throughout the implementation phases for success. The purpose of feedback is improvement. This whole process of improvement requires reviewing, communication, discussion, observations, brainstorming, listening, testing and more. Due to Continuous change in the business process there is need of continuous feedback mechanism.
- **Mode of Communication:** As there are different devices used by different stakeholders the mode of communication should also be implemented in Educational ERP which can communicate to any devices which will help to communicate with different types of mode like E-mail, SMS, Alerts etc.
- **Communication:** As mentioned, strong communication between departments and faculties in the Institutes is the main factor for the success of the implementation. Communication is one of the most challenging and difficult tasks in any ERP implementation project. Therefore, it is important to include a comprehensive communication plan throughout the ERP implementation project. During implementation, users should be apprised of the project status, as well as how and when the rollout will effect them. They also should know when they can expect to be trained, convert to new system and most importantly they should be informed how their existing business processes and day to day works will change.

- **IT Upgradation Policy:** The board of director / Managing Authority of the Technical and Health Science Institutes have IT Upgradation policy in the organization which will help to upgrade the existing system or to adopt new functionalities in Educational ERP as per upcoming Technology.
- **Information Security:** The security provided to Technical and Health science Institutes with Educational ERP system security protection like user level privileges, S/w and H/w and Access list.
- **Recovery action Plan:** The recovery action provided from management to staff and Learners as compare to Health Science is more for Technical Institutes. Therefore the problem solving capacity from vendors should be provided to Health Science Institutes and make aware of the Educational ERP system.
- **Acceptance Testing of Educational ERP system:** There should be business acceptance test with unit Testing, system Testing, system integration testing and user acceptance testing of Educational ERP system will help the institutes board of director or client of the subject under test through trial or review that the Educational ERP system meets mutually agreed –upon requirements.
- **Customization of Educational ERP system:** There are two strategic approaches for implementing Educational ERP system. In first approach no business process re-engineering which is standard package wherein board of director will not ask for change in business process. In second approach customization of existing Educational ERP system should be avoided or minimized as much as possible in order to achieve full benefits of the system. As mentioned by many researchers, if too much customization involves, chances for the implementation to fail could happen because it will prolong the project time, ruin schedules, introduce new bugs into the system, and make the upgrade to the vendors new released software difficult.
- **Change in Technology:** The change in technology makes stakeholders of Educational ERP system to migrate to new technology as on when it requires from the Institutes demand from vendors. As Learners want to

learn new technology and communication using different devices to satisfy the needs of young generation and which will help to the aged stakeholders who can navigate and understand easy to learn technologies.

- **Performance of the Application:** The Board of director and other management staff mainly concern about the performance of the Educational ERP system which will help Institutes to get real time information where all the stakeholders can take decisions within fraction of seconds.
- **Encourage local software companies to prepare themselves:** Local software companies should take steps to become more prepared for handling Educational ERP system which will help to communicate and manage the system the way the authority of Institutes required. The software companies may also need to cooperate among themselves to jointly handle large scale Educational ERP Applications.

6.3.1 From Board of Directors / Management Authorities Perspective

- It is also strongly recommended that organization should ensure that the institutions that intend to implement ERP need to get actively engaged in system study with the vendor so that software is developed as per the needs of the organization.
- It is also suggested that ERP needs to be implemented module wise by implementing pilot projects in select department so that software is customized in a timely manner before its full fledged organization wide implementation.
- Educational institutions need to manage the resistance of employees towards the introduction of software through employee engagement, involvement in implementation, education and training.
- The failure rises from the mis-communication between the ERP vendor's sale team and the business owner. Sales team normally over promised while companies have various level of "systems readiness". It is difficult to evaluate how much the implementation actually costs. In order to win the bid, the sales normally competing by prices and the business owners think to get a great deal.

- For effective implementation, the employee, who resists the change, needs psychological counseling. This counseling will clear their doubts and they may realize the importance of implementation of new technology.
- Avoiding common pitfalls in the EERP software selection process

  a. Looking for the client list were EERP has been implemented by the vendors
  b. Getting the feedback from the client list given by the vendors
  c. Vision and mission of the company for the next generation
  d. Problem solving capabilities of Vendors
  e. Meeting the deadlines of the project
  f. Check for the expertise working for the project i.e. Domain knowledge.
- The implementation of Educational ERP Application can improve the interaction between stakeholders of different department, campus and universities which will increases the administrative effectiveness and efficiency in the Institutes operations.
- Encourage local vendors for development and implementation of Educational ERP system which will minimize the cost of maintenance and the educational ERP system.
- The success of Educational ERP system depends on Training, Performance and Feedback from the stakeholders.
- The Innovation in Teaching and Learning Methodology should easily implement from the existing vendors or any third party vendors.
- The Educational ERP system audit should be carried out from internal staff and external consultant.
- The cost benefits don't come from headcount reduction which seems to be such a common thought process by top management who should know better, the cost benefits come about from the ability to effectively Plan.

6.3.2 From Staff Perspective

- To make Staff computer savvy, the Authority or Board of Directors should provide training and encourage them about use Educational ERP system.

- Performance of the system should be increased which will give accurate and real time information for taking decision.
- The fastest mode of Communication with different users and devices tools should be used.
- Increase awareness and Training sessions which will increase usage of Educational ERP system.
- Proper training should be arranged for new staffs.
- The planned sessions and time-table will help board of director and Learners to know about the topic delivery.
- Content sharing from staffs to Learners should be provided to know about happenings in and around latest technology and applications.
- Board of Directors should take feedback from staffs.
- Security is main concern to protect data.

6.3.3 From Learners Perspective

- To make Learners computer savvy, the Authority or Board of Directors should provide training and encourage them about use Educational ERP system.
- Performance of the system should be increased which will give accurate and real time information for taking decision.
- The fastest mode of Communication with different users and devices tools should be used.
- Increase awareness and Training sessions which will increase usage of Educational ERP system.
- Proper training should be arranged for new Learners.
- The planned sessions and time-table from teaching Staff will help Learners to know about the topic delivery.
- Knowledge management and content sharing from staffs to Learners should be provided to know about happenings in and around latest technology and applications.
- Board of directors should take feedback from Learner.
- Security is main concern to protect data.

6.3.4 From Vendors' Perspective

- The implementers did not fully understand the client's ability to relate to change management psychology in the workplace.
- Due to improper ERP implementation planning schedule and no real-time activity and its progress may lead to failure of ERP systems.
- Customization of business process should be minimized as compare to standard package from vendors.
- Training and Education – the vendors should provide training after implementation of Educational ERP modules or tasks and secondly train the trainers wherein selected people get trained and they train others which can form the chain and so on.
- One of the most common reasons for failure is the IT Manager responsible for the implementation due to domain knowledge of the business and operational requirements.
- Bringing all together key functional areas of a business with their own operation and now you are asking all of these key functional areas to go hand in hand to get whole as Enterprise ERP which itself is long history of mis-trust for sharing I/O with each processes.
- Trusted and secured third party plug-ins should be used to make transaction through their application.

6.4 Designed and Suggested Framework of Educational ERP

Success of the Educational ERP system depends on how we manage to keep compatibility with **Technology, Vendors, Performance and Stakeholders satisfaction**. The term Educational ERP represents the implementation of various educational services for the benefit of Management, staff, students, alumni and industry through which they can avail **24*7** services **Anytime and Anywhere**. The factors for successful Educational ERP system are

1. Unambiguous objectives
2. Committed and effective team
3. Planning
4. Management Controls

5. Repeated reappraisal
6. Communication

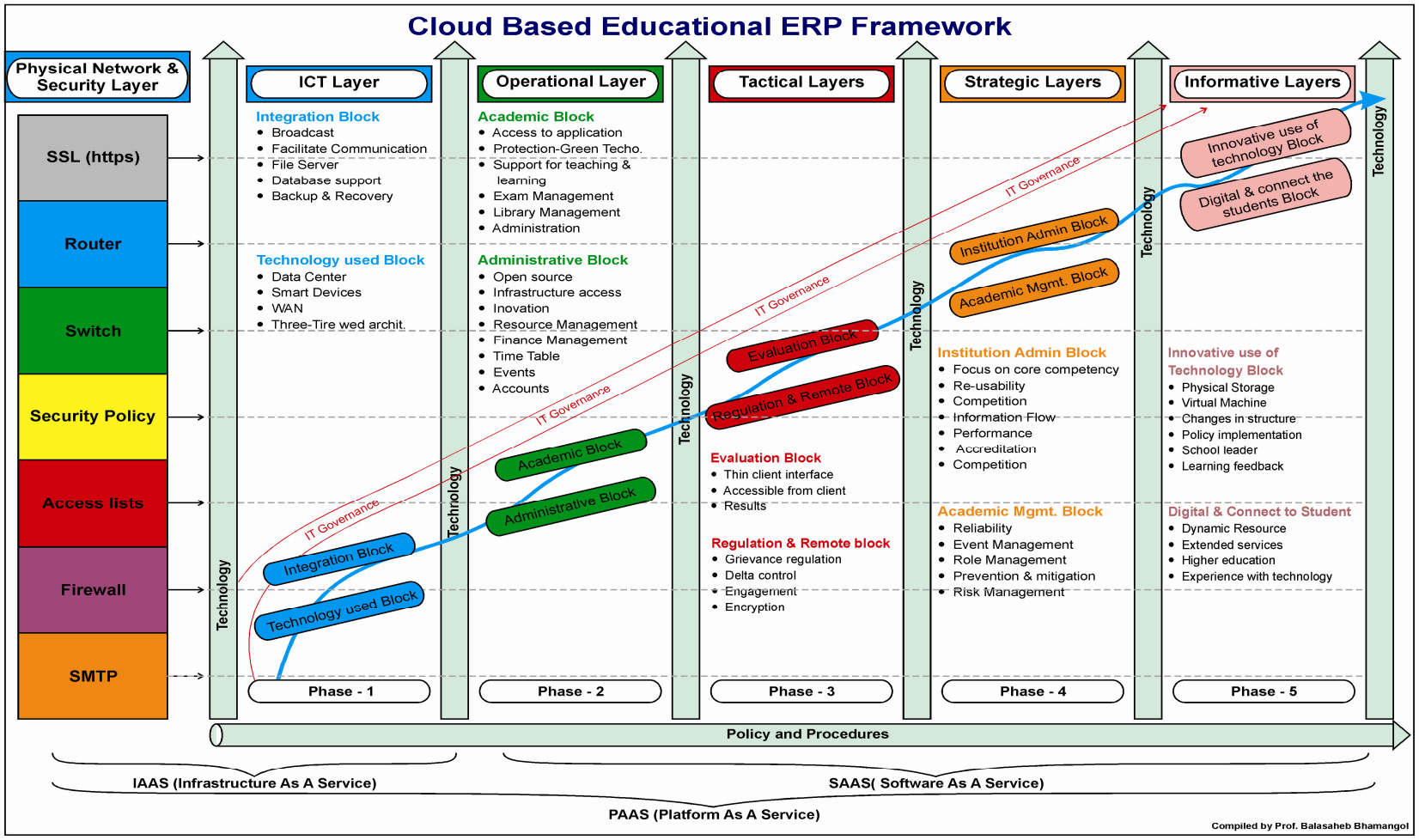
For successful implementation of Educational ERP system, there is need to focus on various central dimensions which are user friendliness, performance, satisfaction, communication, inter-department interaction, Third party software plug-ins, navigation-Help file, data security and Technology etc. The impact on implementation of Educational ERP is to improve access to accurate and timely information, Enhances workflow, increases efficiency, and reduces reliance on paper, tightens controls and automates e-mail alerts, provides user-friendly Web-based interfaces, streamlines processes and eases adoption of best business practices and establishes a foundation for new systems and integrates existing systems.

In the course of the study, it was obtained that the devise of layered framework for the successful implementation of Educational ERP system. A conscious attempt was therefore made to construct such a framework. The researcher therefore presents a **"Cloud based Educational ERP Framework for Educational Institutes"** by considering all the positive aspects of Information communication Technology. It is therefore presented in the following Fig. 6.1.

The researcher has combined all the functionalities and operations of the successful implementation of Educational ERP system services and has developed a new framework to serve the need of today's environment. For designing framework, researcher has referred several significant initiatives have been taken by AICTE, DTE and government to promote ICT in educational sector which helps to increase in rate of growth of GDP. The current developed Frameworks from ION, Academyone Inc, Global Educational Network and connect2gurukul Educational ERP system which don't have promotion and transferring of previous records to the new system for further compliance of the students, staff, parents and industry information like Unique SSN (Social Security Number) in USA for unique identity, India has also implemented UID / Aadhar Card for unique Identity of each citizens using this UID. Researcher has developed Educational ERP framework by using UID through plug-in for UID information of students and employees.

The current framework followed by the Educational ERP system is not adequate to the unique identity of the students and employees. To my knowledge such a layered framework catering to the needs of the implementation of Educational ERP system has not been devised so far.

Figure 6.1: Cloud Based Educational ERP Framework



6.4.1 The Framework: Operations and Functions

Any framework consists of various layers, components and a few other factors. Considering all these components, Figure No. 6.1 gives the detailed mode of operation and functions of the Conceptual cloud based Layered Framework for the Implementation of Educational ERP system. This framework is created and presented based on earlier studies, the researcher's experience and the conclusions arrived at from Chapter 3 and Chapter 5. The researcher has presented this conceptual framework knowing full well that it can't immediately replace the current framework. It requires some extra time as well as basic preparation before implementation. This framework is so designed based mainly on the unique identity of students from KG to PG and employment through UID / Aadhar card. This framework is the best combination of the unique identity of students, staff, parents, alumni and employment in industry with high security of confidential data. As we studied in chapter 3 and chapter 5 educational ERP systems status according to students, staff, parents, alumni and industry point of view, this framework is the best combination of all the studied frameworks implemented by various vendors across globe.

The detail design of the cloud based framework is based on the input from as third party service provider to the educational institutes for further process and security of data. There are Internal as well as External inputs to the system. Internal inputs from Administration, Staff, Students, Placement and for External input Vendors, Parents, Industry, Alumni, authorized body like University, AICTE, DTE and Third party service provider. The user can avail Educational services through various delivery channels like mobiles, kiosks, web ports, personal computers, digital TVs as well as through video conferencing. The UID code will be first taken from UID system of each individual student and then the progress of education will be maintained by institutes and pass this information to other educational institutes where ever he/she moves for taking admission / further study. The report can be given by institutes in the format specified by the Authority of educational Institutes which will be implemented in Educational ERP system. During the interaction, proper authentication and access management will take place for

security purposes and after completion of the transaction the details will be stored in the particular database.

The capacity to monitor and manage the Hardware and Software resources in a distributed IT environment is an essential feature of Cloud offering, enabling us to solve these problems. Cloud computing solutions come in three different versions, according to our clients' specific requirements:

- **Infrastructures as a Service (IaaS)** – a Cloud in which the infrastructure making up the IT environment (server, storage, network) are treated as if they were services.
- **Platform as a Service (PaaS)** – a Cloud in which, besides the infrastructure (server, storage and network), certain operating systems and applications too are treated as services.
- **Software as a Service (SaaS)** – a Cloud offering cloud-resident applications, such as web mails and CRM, in the form of online services.

The system provides functions at different levels with co-existing:

- Service components, used to operationally control the processing subsystems, structured according to the rules governing the Management and Control Centers.
- Integrated workstation monitoring, with respect to both existing and new workstations.
- Service provisioning components.
- Capacity Management functions in the processing environment.
- Service automation, with self-service functions.

IT governance is about meeting strategic objectives (performance) while meeting legal and regulatory, contractual and other obligatory requirements often supported by policies (conformance). The goal is to achieve both in a balanced way. Enterprise governance and IT governance require a balance between conformance and performance goals directed by the board. As we proceed through different Framework layer, for each layer IT governance has to check whether they fulfill goals of Board of Directors requirement.

The blue thick line passing through each layer gives the success of implementation of SaaS, PaaS and IaaS for the organizations.

6.4.2 Layered Architecture

The Educational ERP system platform will consist of mainly six layers namely Physical, Network and security layer, ICT layer, Operational layer, Tactical layer, Strategic layer and Informative layer. The importances of each layer specified are

Layer I: The Physical, Network and security layer consist of physical communication between end stations. It is concerned with the actual encoding and transmission of data in electro-mechanical terms of voltage and wavelength. For purposes of information security we can widen this definition to apply to all physical world factors, such as physical media and input device access, power supply, and any other issue bounded by physical terms. Physical layer controls are Locked perimeters and enclosures, Electronic lock mechanisms for logging & detailed authorization, Video & Audio Surveillance, PIN & password secured locks, Biometric authentication systems, Data Storage Cryptography and Electromagnetic Shielding. The Network layer is concerned with the global topology of the internet work - it is used to determine path and which packet would need to take to reach a final destination over multiple possible data links and paths over numerous intermediate hosts. This layer typically uses constructs such as IP addresses to identify nodes, and routing tables to identify overall paths through the network and the more immediate next-hop that a packet may be forwarded to. The network controls are Network Layer Controls Route policy controls - Use strict anti-spoofing and route filters at network edges, Firewalls with strong filter & anti-spoof policy, ARP/Broadcast monitoring software and Implementations that minimize the ability to abuse protocol features such as broadcast. The Application Layer deals with the high-level functions of programs that may utilize the network. User interface and primary function live at this layer. All functions not pertaining directly to network operation occur at this layer. Application Layer Controls are Application level access controls to define and enforce access to application resources. Controls must

be detailed and flexible, but also straightforward to prevent complexity issues from masking policy and implementation weakness Standards, testing, and review of application code and functionality-A baseline is used to measure application implementation and recommend improvements IDS (Intrusion Detection Systems) systems to monitor application inquiries and activity Some host-based firewall systems can regulate traffic by application, preventing unauthorized or covert use of the network.

Layer II: ICT layer with Integration and Technology block consists of application server like file server, database, tools, backup and recovery and UID like Web, SMS and smart card.

- **Web Services (WS)**: collection of services by a web technology. The services interact with the calling program through input and output parameters.
- **Universal Description Discovery and Integration (UDDI)**: directory of available services (recorded and indexed).
- **Web Services Description Language (WSDL)**: for describing services and access modality.
- **Simple Object Access Protocol (SOAP)**: protocol for the service request. It is a protocol independent from the platform and programming languages.

Integration Block:

- **Broadcast:** It will interlink two or more different areas together to improve performance.
- **Facilitate communication:** This Integration can help for communication between different resources.
- **File Server:** File servers with their directory can be maintained with the help of LDAP and directory structure which will help to segregate the files.
- **Database support:** The bridge between application and the database connection is established to provide real time data.
- **Backup and Recovery:** There should be backup utility devices which will store and keep as back file through scheduling backup plan which will help institute in case of disaster management. Recovery system will help to

retrieve the previous information by taking backup of records on external device.

Technology used block:

- **Data center:** It can be used to store the academic data.
- **Smart services:** Use of smart devices will increase the performance of system.
- **Wide Area Network:** Can be used for communication purpose.
- **Three-Tier Web Architecture model:** It will contain presentation layer, application layer and data layer.

Layer III: Operational layer with Academic and administrative block which consists of academic modules like students, human resource, finance, research, placement, time table, library so on and administrative like configuration, assigning roles, authorizing events, news and content so on. The operational level impact on ERP and estimated cost are as specified below:

i) Impact on ERP:

- transactions' costs
- time to complete transactions
- degree of business process integration
- intra- and inter-organizational information sharing
- business networks
- reporting
- customer satisfaction

ii) Estimation of costs due to:

- user resistance
- personnel training
- external consultants
- additional applications
- system downtime

Academic block:

- **Access to applications fromanywhere:** User can access the applications of education system from anywhere, Place will not matter to access the data.
- **Support for teaching and learning:** different facilities provided by cloud will support for teaching and learning process. Like, Data exchange, communication, Announcements etc
- **Protection of the environment**: framework can protect the environment by using green technologies.
- **Increased openness of students to new Technologies:** By Downloading notes, sharing data, communication etc.

Administrative block:

- **Software free or pay per use:** Institution can pay for the s/w only which are used by them.
- **24 hours access to infrastructure and Content:** Student, Faculties and staff can access the infrastructure and content available on server at any time from anyplace as 24 x 7 facilities is supported.
- **Opening to business environment and advanced research :** users can do the research by using available information as it is authorized and trustworthy information.
- **Increasing functional capabilities**: like Uploading, Downloading, Sharing, Communication, 24x7 facilities, research area is supported.

Layer IV: Tactical layer it focuses on evaluation and regulation remote block which consist of Remote students and outcomes of the system. Remote students mainly focus on grievance where as outcome are related to result, engagement, and encryption of data. The tactical level factors help to Increase efficiency, Reduce operating cost, Respond more rapidly and flexible to a changing environment, Need to extract business intelligence from data over time, Retention and visibility and Students Relation Management (SRM).

Evaluation block:

- **Thin client interface:** This refers to either a software program or to an actual computer that relies heavily on another computer to do most of its work. It operates as part of a network, with the client software or computer acting as an interface and the network server computer doing all the real work, like saving files, processing data, and controlling certain functions of the clients, like whether they can download things or not. This type of setup is commonly used in places with lots of people simultaneously using computers, like businesses or schools. Though this system is often easier to maintain and use, it also has some downsides, including the lack of peripherals and limited performance.
- **Accessible from various client devices:** Student, faculty as well as admin any one can access it by using different devices.

Regulation and remote block :

- **Common Controls:** These are mature control areas associated with traditional IT services environments that are also applicable to cloud - based services, and whose audit mechanisms are considered mature.
- **Delta Controls:** These are higher -risk control areas that have particular relevance to cloud environments, and whose cloud audit mechanisms are less matured.

Layer V: Strategic layer focus on Institute administration and Academic Management block consists of Accreditation and Institute profit like completion, information flow, performance, event management, role management, prevention and mitigation and risk management. Some of the strategic level factors helps to

- Make ERP's contribution to business vision and strategy
- Alignment of business and technology strategy
- Flexibility and scalability of IT architecture, ERP solution to change conditions.
- Integration of business information and processes
- Identification of the various components and magnitude of the project's risk

- Impact of ERP on the decision making process to implement or not an ERP system on the competitive position and market share and cooperative business network.
- Competitors' adoption of ERP
- Estimation of the total cost of ERP ownership by considering organizations' resources
- Analysis and ranking of alternative options in terms of the competitive position of the organization

Institution Admin block :

- Focus on core competency
- Layered Architecture
- **Re-usability:** the data or content can be used again and again whenever required as they will be available on server. It will avoid Duplication also.

Academic Mgt. block

- Collecting Performance Factors from Performance Factors,
- Re-evaluate System Reliability during run-time.
- **Improve automation:** System can be send automated messages, reminders etc and number of things can be converted into same.

Layer VI: Informative layer which focus on Innovation use of technology and digital connect with stakeholders technology, consists of Promote equity and experience with technology for stakeholders, changes in structure, policy implementation, learning feedback and leadership, whereas educations focus on appearance with technology. .

- **Information Services**: This category of capabilities addresses the support of information services. Information services provide a uniform way of representing, accessing, maintaining, managing, analyzing, and integrating data and content across heterogeneous information sources. There are primarily two approaches to achieving that. First approach focuses on building a single view of business-critical data for customers, products, location, and others delivered in context; i.e., single view of enterprise (MDM) approach. The second approach focuses on integrating

the appropriate information in a timely and consistent manner, analyzing and attempting to improve the quality of data, and ensuring consistency and integrity of business-critical data and facts across the enterprise. This approach is known as the Information as a Service (IaaS) approach.

- **Information Integration**: This category of capabilities addresses the support of information integration and enables capabilities for information services.
- **Basic Information Management**: This category of capabilities addresses basic information management concerns such as metadata and unstructured data management.
- **Information Security and Protection**: This category of capabilities addresses the support of information security and protection concerns.
- **Business Analytics**: This category of capabilities addresses the support of businessanalytics and business activity monitoring. It enables organizations to leverage information to better understand and optimize business performance. It supports entry points of reporting to deep analytics and visualization, planning, aligned strategic metrics, role-based visibility, search-based access and dynamic drill-through, and alert and detect in-time actions.
- **Information Definition and Modeling**: This category of capabilities defines fundamental constructs of SOA information and events.
- **InformationRepository**: This category of capabilities addresses support of the information repository in order to persist data such as metadata, master data, analytical data, operational data, and unstructured data.

Innovative use of technology:

New technologies which are emerging those can be added so that performance can be increase.

- Virtual machine
- Host machine
- Physical storage
- CPU disc utilization

Disaster recovery: If data lost due to some reason can be recovered this will be the big advantage for the users of system.

Digital and connect the student block:

Network-hosted application: Application will be available into the network which will provide number of benefits to students.

Faster time to roll out new services: Fast access will be the advantage and dynamic resource which will increase the efficiency.

The architecture will be classified in three ways: centralized, separate database server and replication architecture. Centralized architecture consists of web server, an application server, database server and user interface. The application server, database server and the web server run on the server side while user interface is displayed in the web browser on the end user's machine. The application server performs all the educational ERP application with the help of the database server. The user interacts with the HTML web browser, and the information or request sent to the web server, which passes the user's requests to the application server. There are several mechanisms for communication between the server and the interfaces. One mechanism can be that the entire Educational ERP applications are written in the form Java Servlets and executed on the server side. Any servlets can be involved from the user side. An information technology consists of lots of data to be handled. The database server can be separated from the central entity and can make a proper communication between the central server and the web server. When the user requests for the HTML page, the request goes to the web server that runs the application and takes the required data from the database server. All the e-governance applications reside in Java Apple, which needs to be executed through any one of the delivery channels. The user can avail the entire services through any delivery channels, while the server is only used as a repository. The cloud services offer you the power of choice. You can run some applications on premise, use hosted services managed by vendors, or use a flexible combination of both. Hosted solutions provide familiar features and experience in the cloud for users.

6.4.3. Cost of the Framework

The basic cost of this framework depends on the number of Educational ERP services implemented by Institutes. The cost of the framework is mainly dependent on Server Infrastructure costs, MIS cost, Third party application services cost and other costs.

a) **One Time Cost to run Educational ERP system**

- One time cost to run any Educational ERP application in Institutes is Cost of the EERP, Server and Backup server to run the EERP cost, Cost of civil works and Electrical cost, IT Infrastructure costs include Racks, Firewalls, Intrusion protection system (IPS), Center Core Switch, Database Server, Web Server, and Domain Server, SAN, NAS and UPS.
- Software licenses' cost includes Production & Backup Server cost, Application Server and Network Management System cost.
- Third party services cost like payment gateway, security for H/w and S/w, SMS gateway etc.
- MIS cost for implementing Business Intelligent tools to get various Myriad reports for decision makers from Institutes.
- Other embedded devices through which authentication and authorization of stakeholders can be done from Educational ERP the devices are Bio-metric device, Swipe Card device, Iris Scan device etc.

b) **Run and Maintenance Cost of Educational ERP system**

- Annual maintenance cost of the educational ERP system, Hardware and other related software's.
- Cost of SMS sending to Parents, Industry, Students, Staff and Alumni etc.
- Employees to maintain security – Parents, Industry, Students, Staff and Alumni etc.
- Other costs include Consultancy cost & Project Management cost, Data entry cost, Implementation cost and IT audit cost.

Looking at the one time and run cost that will be involved when you purchase an EERP. In short the following cost will be involved **Table No. 6.1**

Table No. 6.1: Cost of one time, run and maintenance cost

One time cost to run any EERP	Run and maintenance cost
1. Cost of the EERP – Rs. 5,00,000 to Rs. 15,00,000 2. Server and Backup server to run the EERP – 2 servers Rs. 2,00,000 to Rs. 4,00,000 3. UPS with 24 hour backup – Rs. 1,00,000 to Rs. 2,00,000 4. Firewall for the security - Rs. 2,50,000 to Rs. 4,00,000 5. Antivirus, OS and other software's - Rs. 50,000 to Rs. 1,00,000 6. Bio metric devices – Rs. 15,000/Device to Rs 25,000/Device.	1. EERP AMC – 20 % to 30% of total cost of EERP 2. Hardware EERP – 10% to 20 % total cost of Hardware. 3. 100 SMS per student (even if there is 1500 students) – Rs 1,00,000 to Rs 1,50,000 4. Employee to maintain the security and hardware's – Rs 20,000 to Rs 30,000 per employee per month 5. Third party services like payment gateway, security etc. Rs. 1,00,000 6. Lease line / broadband connection – Rs. 1,00,000.

One of the essential factors important for the success of the proposed Educational ERP system at Institutes is to have a professional approach in implementation. All the activities need to be planned in a holistic manner with due provision for operation and maintenance. Operational and maintenance cost includes license cost of post implementation support for MIS, Security, Third party services, database and application server cost. It also includes capital cost of maintenance of IT infrastructure and connectivity cost for DR (Disaster Recovery) & DM (Disaster Management).

For implementation of educational ERP application the cost of the layered framework of Education ERP system is approx. Rs. 10,00,000/-. and 50 percent cost for the following year which is Rs. 5,00,000. As institutes increase the cost of Educational ERP increases but can get some discount on existing Educational ERP application cost.

The disadvantage of this traditional system of maintaining Educational ERP system at Institute end is to increase burden on existing Employees, additional recruitment of Employees with IT specialization, Maintenance Cost of Hardware, Software, Internal and External devices, Hiring of consultant and MIS reporting tools and Business Intelligent tools. So, to reduce all this

burden researcher has designed and suggested layered Framework "**Cloud based Educational ERP Framework for Educational Institutes**".

6.4.4 Implementation of Layered Framework for Educational ERP Services with Cloud computing

Cloud Computing can be defined as providing resources and capabilities of Information Technology (e.g., applications, storages, communication, collaboration, and infrastructure) via services offered by cloud computing providers. According to the definition of National Institute of Standards and Technology (NIST), "Cloud Computing" is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. Cloud computing is "a large-scale distributed computing paradigm that is driven by economies of scale, in which a pool of abstracted, virtualized, dynamically-scalable, managed computing power, storage, platforms, and services are delivered on demand to external customers over the Internet". Cloud computing also allows individuals, teams, and organizations to streamline procurement processes and eliminate the need to duplicate certain computer administrative skills related to setup, configuration and support. Cloud computing solutions can enable an optimum use of resources.

Layered Framework for Implementation of Educational ERP Services with Cloud computing is mainly based on Software as-a-Service (SaaS). SaaS provide required software and Educational ERP system with third party services. In recent days, many research institutes are struggling to adapt Cloud Computing for solving problems that are continuous increasing computing and storage. There are four main factors interests in Cloud Computing:

(1) Rapid decrease in hardware cost and increase in computing power and storage capacity, and the advent of multi-core architecture and modern supercomputers consisting of hundreds of thousands of cores.

(2) The exponentially growing data size in scientific instrumentation/simulation and Internet publishing and archiving.

(3) The wide-spread adoption of Services Computing and Web 2.0 applications.

(4) Up-ward and Down-ward scaling of Educational ERP Applications can be possible with cloud computing with change in the scenario of Institutes / Universities.

The Cloud Computing trend of replacing software traditionally installed on campus computers (and the computers themselves) with applications delivered via the internet is driven by aims of reducing universities' IT complexity and cost. Cloud Computing could be a technological innovation that both reduces IT costs for the college and eliminates many of the time-related constraints for students, making learning tools accessible for a larger number of students. There are many benefits of cloud computing for educational institute and below are listed a few of them

1. With cloud computing, universities can open their technology infrastructures to businesses and industries for research advancements.
2. The efficiencies of cloud computing can help universities keep pace with ever-growing resource requirements and energy costs.
3. The extended reach of cloud computing enables institutions to teach students in new, different ways and help them manage projects and massive workloads.
4. When students enter the global workforce they will better understand the value of new technologies.
5. Cloud computing allows students and teachers to use applications without installing them on their computers and also allows access to saved files from any computer with an Internet connection.
6. Cloud computing substantially reduces the capital expenses incurred by an enterprise in order to implement an ERP system. The part of the upfront costs that is mainly reduced includes expenses for hardware, user licenses and implementation, excluding user training and customization.
7. Cloud-based ERP lowers operating costs for energy, maintenance, configuring, upgrades, and other IT staff costs and efforts.
8. Rapid implementation and immediate services to the Institutes is the benefit of cloud based ERP system.

9. **Service quality:** Reliable services, large storage and computing capacity and the user will get 24*7*365 services and up-time.
10. **Focus on core competencies:** We can outsource non-critical applications to service providers and we may focus on the more business-critical applications. Also organization can work on their core competency area and focus on those to run Institutes smoothly.
11. Scalability in terms of resources pooling and rapid resource elasticity of cloud based ERP makes the infrastructure capacity highly elastic.
12. Access to advanced technology as updates are automatic without paying new purchase costs to the vendor.
13. Improve accessibility, mobility and usability can be increased to higher level then traditional ERP system.
14. Rapid updates and upgrades of Cloud-based ERP systems usually get faster with new functionality than traditional ERP system
15. Easier integration with cloud services: benefits of SaaS shared infrastructure, Institutes / Universities that adopt cloud-based ERP may get relatively inexpensive integration with other cloud services once respective cloud providers have integrated there infrastructures.
16. Improved system availability and disaster recovery where in many cases of SaaS providers ensure measures such as backup routines, fallback and recovery procedures, conditioned power etc. of higher quality than most Institutes / Universities do in-house.
17. Data Centers may have many risks, like attack of viruses, hackers, fire and terrorists at some time. Such disasters possess mass destructibility and even intentioned activities after disasters. Distributed data centers provide fault tolerance against such disasters.

After implementation of Cloud based Educational ERP Framework for Educational Institutes the cost of this framework the approx. price of educational ERP system will reduce to Rs. 1,50,000/- which includes the ERP application, Security of Data, Database and new technology and can easily possible to integrate with other service provider for any other application. Integration of application and migration of data not required, whole responsibility is taken care of vendor.

Only the cost of training and lease line / broadband will be more on top of Educational ERP system.

Looking at the one time and run cost that will be involved when you purchase of cloud based EERP. In short the following cost will be involved **Table No. 6.2**

Table No. 6.2: Cost of one time, run and maintenance cost

One time cost to run any cloud based Educational ERP system	Run and maintenance cost
1. Cost of the EERP – Rs. 1,50,000 to Rs. 3,00,000 2. Bio metric devices – Rs. 15,000/Device to Rs 25,000/Device.	1. Hardware – 10% to 20 % 2. 100 SMS per student –As part of Educational ERP service for Rs 5,000 students 3. Employee to maintain the security and hardware's – Rs 20,000 to Rs 30,000 per employee per month 4. Third party services like payment gateway, security etc. – As part of Educational ERP system. 5. Lease line / broadband connection – Rs. 1,00,000.

Table No. 6.3: Comparison of Cost with traditional and cloud based ERP system

A	One time cost to run any EERP	Traditional Educational ERP system (Required Y/N)	Cloud based Educational ERP system (Required Y/N)
1	Cost of the EERP	Y	Y
2	Server and Backup server to run the EERP	Y	N
3	UPS with 24 hour	Y	N
4	Firewall for the security	Y	N
5	Antivirus, OS and other software's	Y	N
6	Bio metric devices	Y	Y
B	**Run and maintenance cost**		
1	Educational ERP AMC	Y	N
2	Hardware EERP	Y	Y
3	100 SMS per student (even if there is 1500 students)	Y	N
4	Employee to maintain the security and hardware's	Y	N
5	Third party services like payment gateway, security etc.	Y	Y
6	Lease line / broadband connection	Y	Y

6.5 Future Scope and Limitations

The researcher has set goals and objectives for the study purpose and studied accordingly. Since in depth study in these areas will take long duration to study every aspect of Educational ERP system, since there are more aspects to cover horizontally and vertically which is of different types of Universities and Educational ERP system with different vendors. The scope of the investigations can be further expanded to follows:

Due to limitation of time in obtaining data from number of institutes Board of Directors, staff and learners the work has been restricted to geographical corners of Pune District only. A study covering all Statutory, Deemed and private Universities under each and every state of India would be more useful where in the AICTE, DTE and Universities get the required complains reports where data can be plugged in from individual Educational ERP systems.

- Researcher has studied only Institutes satisfaction with Board of Directors, staff and learners in implementation of Educational ERP system; however further research can be under taken to study the relationship between Institutes and Vendors.
- Further the researchers can study of Educational ERP system comparative with statutory, Deemed and private Universities with help of case study methodology which will help bridge gap between the universities.
- There is continuous change and innovation happening in the field of technology and Educational system where the methodology and tools are revolving around ERP system. Due to the young generation making utilization of such system the continuous change is required in business processes from time to time which will minimize the paper work and increase the effectiveness and efficiency of operations of educational institution. To implement and incorporate the changes in existing Educational ERP system is not immediately possible. And so up gradation in the Educational ERP is slow. So to achieve all these targets it requires MNC software companies or any authorized body like AICTE, DTE and Universities to undertake research which will widen the scope in every aspect of Educational ERP system.

6.6. Scope and limitation of the study

The existing scenario in Pune region which is having a status of "Oxford of the East", an educational hub. Having variety of courses and faculties in education at University / Institutes and college level it has become a herculean task for controlling authorities. In order to satisfy their task and obtain expected result EERP like solutions have started gaining importance since last five years.

However cost benefit analysis is not proved favorable to limited extent for these Institutions because of inherent weaknesses. The researcher made efforts to bring probable positive solutions for this problem by undertaking and in-depth study. Though the objective has very practical and aim was also very high, due to limitations it restricted its scope.

1. To cover all University / Institutes and colleges right from school level education to University level could not be made due to time and distance limitation. Since the Pune education region has increased by leaps and bounds.
2. To cover the above areas and to get expected results time factor was considered as strong limitation.

Hence in view of the above reasons / limitations the researcher could cover 56 Institutes engaged in higher education only.

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Annexure 1

Questionnaire for Management

Questionnaire for the Institutes and Universities who have implemented and are in the process of implementing Educational Enterprise Resource Planning (EERP).The researcher is conducting survey and recording information to carry out research which will help researcher to come up with suitable outcome for the Institutes and Universities in and around Pune District.

Q.1 **Did you come across any Educational ERP system?**

Yes No

Q.2. **Did you implement Educational ERP system (partially or fully) in your organization?**

Yes No

A) **If Yes, (Proceed to question a and b)**

a) How long it has been implemented in your organization? (Select Single)

1. Less than one year	
2. More than one year and below two years	
3. More than 2 years and below three years	
4. Above three years	

b) Which objectives are most important for your organization? (Select Multiple)

1. Transform the way the institute operates	
2. Modernize the campus with IT environment	
3. Replace old legacy systems	
4. To Increase efficiency	
5. Enhance accountability / regulatory compliance	
6. Provide better management tools	
7. Improve services for management, faculties and students	
8. Keep organization competitive	
9. Others (Please Specify): _____ _____	

B) **If No, Any other software system implemented for different department?**_____

C) **What is the cost of regular system before implementing Educational ERP?**

Less than 3 lac	3 lac and less than 6 lac	6 lac and less than 9 lac	9 lac less than 12 lac	12 lac and above

D) **Which ERP vendor have you selected? (Select Single)**

☐ SAP ☐ Oracle ☐ PeopleSoft ☐ Ramco

☐ Datatel ☐ Jenzabar ☐ Legacy system ☐ In-house

☐ Other (Pls. Specify)_____

E) **What is the Cost of Your Educational ERP software system? (Select Single)**

Less than 3 lac	3 lac and less than 6 lac	6 lac and less than 9 lac	9 lac less than 12 lac	12 lac and above

F) **What is the cost of Hardware and other software(Servers, desktop, storage, network, database, OS)**

Less than 3 lac	3 lac and less than 6 lac	6 lac and less than 9 lac	9 lac less than 12 lac	12 lac and above

Q.3. **How significantly did you customize your Educational ERP system from the vendor? (Select Single)**

1. Completely Customization	
2. Significant Customization	
3. Moderate Customization	
4. Standardize Package	

Q.4. **Do you have any IT up gradation policy in your organization?**

Yes No

Q.5. **Following are Educational ERP cost related statements, Kindly state to what extent you agree or disagree with the statement. (Select Single in each Row)**

1=Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=strongly Agree

	1	2	3	4	5
1. Educational ERP system is less costly to enhance / upgrade than the system(s) that were replaced	☐	☐	☐	☐	☐
2. Educational ERP system is less costly to maintain and operate the system(s) that were replaced	☐	☐	☐	☐	☐
3. Educational ERP systems is less costly to integrate than the system(s) that were replaced	☐	☐	☐	☐	☐
4. Educational ERP systems make it easier to take advantage of new technology	☐	☐	☐	☐	☐

Q.6. **Do you posses the required Infrastructure facilities needed for implementing Educational ERP?**

Yes No

If Yes, Required Infrastructure for Implementing Educational ERP system

1. Hardware (Server with Core 2 Duo, 3GB RAM, HDD 30GB, Ethernet card and CDROM etc..)	☐
2. Software (Microsoft windows 2000, XP, Vista, Linux, Open Solaris, Red Hat, Solaris etc..)	☐
3. Database (Oracle 10g, DB2, PostgreSQL, SQL Server, Sybase etc…)	☐
4. Backup Utilities (Auto-Backup, Scheduling Backup, Internal and External Devices etc..)	☐
5. Internet Bandwidth (below 200 Users - 1 Mbps, Above 200 and below 500 Users - 2 Mbps, Above 500 Users - 4 Mbps)	☐
6. Upgradation of Educational ERP (Software and Hardware upward compatibility)	☐

If No, Is the budget reserved for IT Infrastructure /up gradation.

Yes No

Q.7. **What kind of security do you provide to protect Information? (Select Multiple)**

S/w & H/w Firewall User level Privileges Access List ☐ Others Specify:_____ _____

Q.8. **Following are the factors that normally influence organizations' ERP purchase decision, Kindly state to what extent you agree or disagree with these statements. (Select Single in each Row)**
1=Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=strongly Agree

Factors	1	2	3	4	5
1. Educational ERP system fulfill your objectives	☐	☐	☐	☐	☐
2. Decision Making tools	☐	☐	☐	☐	☐
3. Record storage & archiving and retrieval	☐	☐	☐	☐	☐
4. Monitoring System or Dashboard	☐	☐	☐	☐	☐
5. Time saving	☐	☐	☐	☐	☐
6. Increased in productivity	☐	☐	☐	☐	☐
7. Is the organization getting satisfactory Return On Investment	☐	☐	☐	☐	☐
8. Efficient for inter-departmental coordination	☐	☐	☐	☐	☐

Q.9. **Which Educational ERP mode is used for communication purpose? (Select Multiple)**

SMS E-mail Alerts Others Specify:_____

Q.10 **To what extent Educational ERP system interface user friendly?**

.		Very Unfriendly	Somewhat Unfriendly	Neutral	Somewhat friendly	Very friendly	

Q.11 .

Did you ever request for re-engineer the business processes of Educational ERP?

Yes No

If Yes, When (Select Single)

1. Prior to the implementation	☐
2. As part of the implementation	☐
3. After the implementation	☐
4. No re-engineering requested	☐

Q.12 .

Which Educational ERP modules were implemented? (Select Multiple)

- ☐ Admin
- ☐ Admission
- ☐ Student
- ☐ Fee Collection
- ☐ Result Processing
- ☐ Result Analysis
- ☐ Examination
- ☐ Utilities
- ☐ Organization
- ☐ Transport Facilities
- ☐ Hostel
- ☐ Knowledge Management
- ☐ Library Management
- ☐ Placement
- ☐ H R Management
- ☐ Staff
- ☐ Payroll Management
- ☐ Financial Accounting
- ☐ Asset Management
- ☐ Research and Consultancy
- ☐ Transport
- ☐ Feedback / suggestion mechanism
- ☐ Alumni
- ☐ Quiz
- ☐ Hospital
- ☐ Parents
- ☐ Please Specify(Any Other) _____

_____

Q.13 .

Does any Access control Plug – in for Educational ERP systems exist?

Yes No

If Yes, Which Access control Plug-in are used? (Select Multiple)

- ☐ SMS Plug-in
- ☐ Web Portal Plug-in
- ☐ Result Processing Plug-in
- ☐ Access Control Plug-in

Q.14 .

Which usages of Educational ERP are provided to stakeholder? (Select Multiple)

- ☐ Result publication on SMS
- ☐ Exam Date Information
- ☐ Customized wishes
- ☐ Admission Confirmations
- ☐ Fees Information
- ☐ News / Events information
- ☐ Student's Progress Report / Activities Information to parents
- ☐ Homework information
- ☐ Holidays information
- ☐ Bus information
- ☐ Placement schedules / selection / cancellation
- ☐ Urgent alerts to parents/students
- ☐ Contact information & Address
- ☐ Individual SMS messages
- ☐ Daily attendance for students parents (auto generated)
- ☐ Group SMS messages
- ☐ Please Specify(Any Other) : _____

Q.15

To what extent you are satisfied with the performance of the ERP system? (Select Single)

Highly Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Highly Satisfied

If Not Satisfied, what are the reasons of dis-satisfaction? (Select Multiple)

1. Not aligned with the business process	
2. Lack of maintenance support	
3. MIS reports are not satisfactory	
4. Difficult to use / operate	
5. Others (Please Specify): _____ _____	

Q.16 .

Does management provides training on Educational ERP?

Yes No

If Yes,

a) What is the duration of the training given to the users? (Select Single)

1 day 2 days 3 days 4 days 5 days and above

Q.16.

b) On an average what is the increase in training and maintenance cost for last one year. (Select Single)

1. Increased by over 100%	
2. Increased by 51-100%	
3. Increased by 26-50%	
4. Increased by 10-25%	
5. Stayed about the same	

Q.17.

Are you satisfied from the vendors' recovery action (Problem Solving Capabilities) with regards to Educational ERP?

Yes No

If Yes, What is the duration of solving the problem/ bug?(Select Single)

1. Within 24 hours	
2. Within one week	
3. 2-3 weeks	
4. One month and above	

Q.18.

Educational ERP Provide better management tools. (Select Single in each Row)

1=Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=strongly Agree

Factors	1	2	3	4	5
1. Decision Making	☐	☐	☐	☐	☐
2. Planning	☐	☐	☐	☐	☐
3. Controlling	☐	☐	☐	☐	☐
4. Directing and Analyzing	☐	☐	☐	☐	☐

Please write your Suggestions / Comments:

_____

_____

Personal Details of management

Name (optional): _____

Designation: _____ **Institute:** _____

Gender: Male ☐ Female ☐ **Age:** _____ Yrs. **Email:**_____

Contact Number (optional): _____ **Signature:** _____

Annexure 2

Questionnaire for Staff

Questionnaire for the Institutes and Universities who have implemented and are in the process of implementing Educational Enterprise Resource Planning (EERP). The researcher is conducting survey and recording information to carry out research which will help researcher to come up with suitable outcome for the Institutes and Universities in and around Pune District.

Q.1.

a. Did you come across any Educational ERP system?

Yes No

b. Has your organization implemented Educational ERP system (partially or fully)?

Yes No

A)

If Yes, which objectives are most important for your organization? (Select Multiple)

1. Transform the way the institute operates	
2. Modernize the campus with IT environment	
3. Replace old legacy systems	
4. To Increase efficiency	
5. Enhance accountability / regulatory compliance	
6. Provide better management tools	
7. Improve services for management, faculties and students	
8. Keep organization competitive	
9. Others (Please Specify): _____ _____	

B)

If No, any other software system implemented for different department?

_____

Q.2.

What kind of security do you provide to protect Information? (Select Single)

S/w & H/w Firewall	User level Privileges	Access List	☐ Others Specify:_____ _____

Q.3 **Following are the factors that normally influence organizations' ERP system, Kindly state to what extent you agree or disagree with these statements. (Select Single in each Row)**

1=Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=strongly Agree

Factors	1	2	3	4	
1. Educational ERP system fulfill your objectives	☐	☐	☐	☐	
2. Decision Making tools	☐	☐	☐	☐	
3. Record storage & archiving and retrieval	☐	☐	☐	☐	
4. Monitoring System or Dashboard	☐	☐	☐	☐	
5. Time saving	☐	☐	☐	☐	
6. Increased in productivity	☐	☐	☐	☐	

Q.4. **Which Educational ERP mode is used for communication purpose? (Select Multiple)**

SMS	E-mail	Alerts	Others Specify :_____

Q.5. **Which usages of Educational ERP are provided to stakeholder? (Select Multiple)**

- ☐ Result publication on SMS
- ☐ Holidays information
- ☐ Exam Date Information
- ☐ Bus information
- ☐ Customized wishes
- ☐ Placement schedules / selection / cancellation
- ☐ Admission Confirmations
- ☐ Urgent alerts to parents/students
- ☐ Fees Information
- ☐ Contact information & Address
- ☐ News / Events information
- ☐ Individual SMS messages
- ☐ Student's Progress Report / Activities Information to parents
- ☐ Daily attendance for students parer (auto generated)
- ☐ Homework information
- ☐ Group SMS messages
- ☐ Please Specify(Any Other) : _____

Q.6. **To what extent Educational ERP system interface user friendly?**

Very Unfriendly	Somewhat Unfriendly	Neutral	Somewhat friendly	Very friendly

Q.7. **Which Educational ERP modules access has been given to you? (Select Multiple)**

- ☐ Admin
- ☐ Transport Facilities

	☐ Admission ☐ H R Management ☐ Student ☐ Staff ☐ Fee Collection ☐ Payroll Management ☐ Result Processing ☐ Financial Accounting ☐ Result Analysis ☐ Asset Management ☐ Examination ☐ Research and Consultancy ☐ Utilities ☐ Transport ☐ Organization ☐ Feedback / suggestion mechanism ☐ Placement ☐ Alumni ☐ Hostel ☐ Quiz ☐ Knowledge Management ☐ Hospital ☐ Library Management ☐ Parents ☐ Please Specify(Any Other) _____ _____
Q.8.	**To what extent you are satisfied with the performance of the ERP system? (Select Single)** Highly Dissatisfied | Somewhat Dissatisfied | Neutral | Somewhat Satisfied | Highly Satisfied **If Not Satisfied, what are the reasons of dis-satisfaction? (Select Multiple)** 1. Not aligned with the business process 2. Lack of maintenance support 3. MIS reports are not satisfactory 4. Difficult to use / operate 5. Others (Please Specify): _____ _____
Q.9.	**Does management provides training on Educational ERP?** Yes No **If Yes, What is the duration of the training? (Select Single)** 1 day 2 days 3 days 4 days 5 days and above
Q.10.	**Are you satisfied with the management about Recovery action (problem solving capabilities) with regards to Educational ERP?** Yes No **If Yes, What is the duration of solving the problem/ bug?(Select Single)**

		1. Within 24 hours	
		2. Within one week	
		3. 2-3 weeks	
		4. One month and above	

Q.11 **Educational ERP Provide better management tools (Select Single in each Row)**

1=Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=strongly Agree

Factors	1	2	3	4	5
5. Decision Making	☐	☐	☐	☐	☐
6. Planning	☐	☐	☐	☐	☐
7. Controlling	☐	☐	☐	☐	☐
8. Directing and Analyzing	☐	☐	☐	☐	☐

Q.12 **Does management takes feedback of Educational ERP?**

Yes No

If Yes, How frequently (Select Single)

1-15 days	16-30 days	1 month to 3 months	4 months to 6 months	7 months abov

Please write your Suggestions / Comments: _____

_____

Personal Details:

Name (optional): _____

Designation: _____ **Institute:** _____

Gender: Male ☐ Female ☐ **Age:** _____ Yrs. **Email** _____

Contact Number (optional): _____ **Signature:** _____

Annexure 3

Questionnaire for Learners

Questionnaire for the Institutes and Universities who have implemented and are in the process of implementing Educational Enterprise Resource Planning (EERP). The researcher is conducting survey and recording information to carry out research which will help researcher to come up with suitable outcome for the Institutes and Universities in and around Pune District.

<table>
<tr><td>Q.1.</td><td>a. Did you come across any Educational ERP system?
Yes No
b. Has your organization implemented Educational ERP system (partially or fully)?
Yes No</td></tr>
<tr><td>Q.2.</td><td>What kind of security do you provide to protect Information? (Select Single)
S/w & H/w Firewall User level Privileges Access List ☐ Others Specify:_____
_____</td></tr>
<tr><td>Q.3</td><td>Following are the factors that normally influence organizations' ERP system, Kindly state to what extent you agree or disagree with these statements. (Select Single in each Row)

1=Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=Strongly Agree
<table>
<tr><th>Factors</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th></tr>
<tr><td>1. Does Educational ERP system fulfill your objectives</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td></tr>
<tr><td>2. Decision Making tools</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td></tr>
<tr><td>3. Monitoring System or Dashboard</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td></tr>
<tr><td>4. Time saving</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td></tr>
</table></td></tr>
<tr><td>Q.4.</td><td>Which Educational ERP mode is used for communication purpose? (Select Multiple)
SMS E-mail Alerts Others Specify:_____</td></tr>
<tr><td>Q.5.</td><td>Which usages of Educational ERP are provided to stakeholder? (Select Multiple)
☐ Result publication on SMS ☐ Holidays information
☐ Exam Date Information ☐ Bus information
☐ Customized wishes ☐ Placement schedules / selection /</td></tr>
</table>

cancellation

- ☐ Admission Confirmations
- ☐ Fees Information
- ☐ News / Events information
- ☐ Student's Progress Report / Activities Information to parents
- ☐ Urgent alerts to parents/students
- ☐ Contact information & Address
- ☐ Individual / group SMS messages
- ☐ Daily attendance for students parents (auto generated)
- ☐ Please Specify(Any Other) : _____

Q.6. **To what extent Educational ERP system interface user friendly? (Select Single)**

Very Unfriendly	Somewhat Unfriendly	Neutral	Somewhat friendly	Very friendly

Q.7. **Which Educational ERP modules access has been given to you? (Select Multiple)**

- ☐ Student
- ☐ Placement
- ☐ Utilities
- ☐ Hostel
- ☐ Alumni
- ☐ Parents
- ☐ Library Management
- ☐ Result Analysis
- ☐ Knowledge Management
- ☐ Transportation
- ☐ Feedback / suggestion mechanism
- ☐ Quiz
- ☐ Please Specify(Any Other):_____

Q.8. **To what extent you are satisfied with the performance of ERP system? (Select Single)**

Highly Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Highly Satisfied

If Not Satisfied, what are the reasons of dis-satisfaction? (Select Multiple)

1. Not aligned with the business process	
2. Lack of maintenance support	
3. MIS reports are not satisfactory	
4. Difficult to use / operate	
5. Others (Please Specify): _____ _____	

Q.9.	**Does management provides training on Educational ERP?** Yes No **If Yes, What is the duration of the training? (Select Single)**

1 day	2 days	3 days	4 days	5 days and above

Q.10 .	**Are you satisfied with the management about Recovery action (problem solving capabilities) with regards to Educational ERP?** Yes No **If Yes, What is the duration of solving the problem/ bug?(Select Single)**

1. Within 24 hours	
2. Within one week	
3. 2-3 weeks	
4. One month and above	

Q.11	**Does management takes feedback of Educational ERP?** Yes No **If Yes, How frequently**

1-15 days	16-30 days	1 month to 3 months	4 months to 6 months	7 months and above

Please write your Suggestions / Comments:

_____

Personal Details:

Name (optional): _____ **Institute:** _____

Gender: ☐ Male ☐ Female **Age:** ____ Yrs. **Email:** _____

Contact Number (optional): _____ **Signature:** _____
