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A study on ERP systems and their effects on Organization in selected construction chemical companies in Chennai

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Abstract- The world has become more digitized. At present, co-ordination of operation and information in order to elevate the efficiency is one of the processes of organizations. Organizations are looking for an information system that can handle huge workloads. This is where enterprise Resource planning systems come into play. An Enterprise Resource Planning integrates various subsystems into one huge system that shares one database. It enhances productivity and brings more benefit to companies. The aim of this research is to study whether Enterprise Resource Planning systems cause increasing performance effectiveness and changing administration practices in organization. Enterprise Resource Planning systems have increased efficiency and changed management accounting practices in companies. This paper analyses the Enterprise Resource Planning systems and their effects on Organization. In this paper both essential and optional information were gathered. Structured questionnaires were used to collect primary data from the Organizations' employees through questionnaires. The secondary data was gathered from website and reports. For statistical analyses, used SPSS and Statistical tools like (i.e.) percentage analysis, ANOVA, Correlation, Chi-square, Multiple regression- test and 't' test. The findings based on Research hypothesis, demographic profile and various dimensions of Enterprise Resource Planning (ERP) systems and their effects on Organization. Suggestions and Conclusion will be founded on these findings.

Keywords: Enterprise Resource Planning (ERP), SPSS, ANOVA

I. INTRODUCTION

Information Technology and the development of Information Systems have drastically revolutionaries in the all Organization world and the aspects and features of the local and global commerce. ERP provides automated help for Organization process and bring all activities under one roof which produces operational benefits and improved efficiency. Since the start of organization, strategies were researched to improve business forms. This is when PC frameworks and databases were acquainted with the business world. The ERP system isn't just about incorporating different subsystems into one monstrous system; it is fundamentally more than that. It is a system whereby organizations have a whole electronic organization. Nevertheless, everything new brings new challenges.

The ERP system represents enterprise resource planning. It is fundamentally an information system that consolidates into one system. Organizations that produce and sell certain products, are acting in four main operation areas. All these areas also include connected subprograms and activities that in turn, shape business process of their respective organizations. ERP frameworks collectively have covered four primary zones, including: Control and Marketing; production and sale; support; and marketing and development.

The benefits of an ERP system can be classified into five different types. They are, Operational benefits: An ERP system automates day-to-day operational processes and thus, one would expect that the system offers benefits in terms of cost reduction, cycle time reduction furthermore improvement in productivity, quality as well as client service. Managerial benefits: ERP framework with their information bases and data analysis capacities can encourage decision making and improve performance in operating divisions. Hence, ERP frameworks provide planning benefits to the executives. Strategic benefits: An ERP framework can give an organization IT-based competitive advantage by assisting establishment of external alliances with clients and by promoting business development, innovation and differentiation. IT foundation benefits: An ERP system makes an infrastructure that facilitates an organization to adapt to future changes and simultaneously reduces IT costs and increases capability to implement other applications. Finally, Organizational benefits: An ERP system improves working patterns, organizational learning and communication among people. Therefore, improvements in organizational culture are also possible.

II. REVIEW OF LITERATURE

Wu and Wang (2014) studied key-user fulfillment as a way of figuring out ERP system accomplishment by method of perusing ERP system characteristics critical for the surroundings. By the way of the utilization of rigorous and systematic interview techniques and iterative improvement procedures, they selected a few formerly proven consumer satisfaction instruments. They found that key-user fulfillment is closely related to the perceived system success, and it could be employed as measure of system success in an ERP environment. Moreover, they recognized that the key-user fulfillment evaluation for ERP system is multidimensional constructs, which consist of ERP product, contractor service, and information and involvement, interwoven with each other and one cannot focus exclusively on any single issue in evaluating typical ERP success.

Plaza and Rohlf (2015) attempted to present a method of choosing a training strategy minimizing project costs, and analytical procedure for appropriately predicting a venture completion date, and theoretical basis for empirical studies mastering and ERP executions. They contended that even though comparative analysis of procedures cannot be conducted on the premise consulting costs alone, the combination of formal training at the assignment is the extreme useful choice from the consulting value attitude, and training/implementation strategy ought to be decided on and assessed in the course of the project planning section.

Ke and Wei (2016) researched how organization can affect ERP execution by encouraging the desired organizational culture. They contended that ERP execution is positively related with organizational culture along the component of learning and development, participative decision making, power-sharing, guide and collaboration, and tolerance for risks and conflicts. They enunciated traits of organizational culture which are conductive to ERP utilization and match ERP frameworks' inserted administration reasoning.

Chou and Chang (2017) tested ERP execution at the post implementation stage from managerial intervention point, featuring that both customization and organizational mechanism, as two corresponding approaches to alignment, have an effect on intermediate advantages, such as coordination strengthening and task efficiency. They found that for a firm that has carried out ERP, the additional customization is related to more task coordination enhancements of ERP accumulated to that firm. In such firms, greater enhancement in coordination with related sub-units, and greater task efficiency is associated with more standard ERP benefits.

Youngberg et al., (2018) studied professional independent end- clients and investigated their perceptions associated with several generation acceptance elements for a newly established ERP structures factor, focusing on end- clients perception of ERP thing convenience, their aim to apply the framework, and self- expressed utilization of a system aspect. They contended that organizations must deliberately foster generation attractiveness technology through end- clients so one can totally exploit the abilities of complex technologies. The believed that to be able to layout organizational strategies to boom system usage, higher knowledge of determinants of user acceptance and usage is obligatory. They concluded that, in conjunction with managing records, records desires to be correct and effortlessly handy to managers for analysis so as to assist them benefit a competitive benefit, indicating that information quality and job overall execution of the information furnished has a right way have an impact on the perceived convenience of the overall facts framework.

III. RESEARCH METHODOLOGY

Need of the study

All the Organization have to increase control production tasks, increase control on warehouse, increase control on procurement and provides more timely information, high operation speed and improved export process is the main problem for the executives. Thus, this paper will analyse ERP systems and their effects on the organization in selected construction Chemical companies in Chennai.

Objectives of the study

The research has been undertaken with the following objectives:

1. To examine the level of ERP systems and their effects on the organization.
2. To describe the various demographic profile of the employees.

3. To find-out ERP systems on sale unit and Production unit.
4. To analyze various factors of ERP systems and their effects on the organization.
5. To find out suitable suggestions for the employees who are working in the construction chemical companies to increase Organizations' sales and profits.

Research Design

Research design proposed for the study is 'Descriptive' kind of research design. This type of research deals with employees' who are working in the construction chemical companies in Chennai. In this paper the researcher attempts to analyze the various dimensions of ERP systems and their effects on the organization such as ERP systems on the sale unit, ERP systems on the planning units, ERP systems on the production unit, ERP systems on the inventory and warehouse unit and ERP systems on accounting unit. Hence descriptive design was adopted.

Data collection

Data was collected in two ways.
i. Primary data and
ii. Secondary data.

Primary data

The primary data was collected by questionnaire survey method based on a pilot study. The primary data are those data which are collected a fresh and for the first time. It is the first hand data collected directly from the employees who are working in the construction chemical companies with a designed schedule for the purpose at Chennai in Tamil Nadu.

Secondary data

Secondary data was collected from websites, journals and research articles to support the research.

Research Hypothesis:

1. There is a significant correlation between respondents' age and various dimensions of ERP systems and their effects on organization.
2. There is a significant difference between respondents'gender and various dimensions of ERP systems and their effects on organization.
3. There is a significant difference between respondents' educational qualification and various dimensions of ERP systems and their effects on organization.
4. There is a significant difference between respondents' marital status and various dimensions of ERP systems and their effects on organization.
5. There is a significant difference between respondents' type of management and various dimensions of ERP systems and their effects on organization.
6. There is a significant variance among the respondents' department with regard to various dimensions of ERP systems and their effects on organization.
7. There is a significant relationship between ERP systems on planning unit, ERP systems on Inventory and warehouse, ERP systems on accounting unit and ERP systems and their effects on organization.

Sampling techniques

Sample size: 80. The sample data was collected from the employees who are working in the construction chemical companies at Chennai in Tamil Nadu. Simple random sampling technique is used for the study. A simple random sample takes a small, random portion of the entire population to represent the entire data set, where each member has an equal probability of being chosen.

Period of study

The study on ERP systems and their effects on organization in selected construction chemical companies in Chennai was carried out for the period of September 15th to October 15th 2020.

Analysis of data

The analysis of the collected data was carried out using percentage analysis, correlation test, 't' test, ANOVA test and multiple regression-test.

Table 1: Karl Pearson's Co-Efficient of correlation between the respondents' Age and various dimensions of ERP systems and their effects on organization

S.No	ERP systems and their effects on organization	Correlation value	Statistical Interface
1.	ERP systems on sale unit	**0.859****	**P < 0.01 Significant**
2.	ERP systems on the planning units	**0.827****	**P < 0.01 Significant**
3.	ERP systems on production unit	**0.809****	**P < 0.01 Significant**
4.	ERP systems on Inventory and warehouse unit	**0.772****	**P < 0.01 Significant**
5.	ERP systems on accounting unit	**0.808****	**P < 0.01 Significant**
6.	ERP systems and their effects on organization	**0.811****	**P < 0.01 Significant**

**** Correlation is **significant** at the **0.01** level
* Correlation is **significant** at the **0.05** level

Table 1: There is a significant relationship between age of the respondents and various dimensions of ERP systems and their effects on organization such as ERP systems on sale unit, ERP systems on the planning units, ERP systems on production unit, ERP systems on Inventory and warehouse unit and ERP systems on accounting unit.

Table 2: 't' test between respondents' Gender and various dimensions of ERP systems and their effects on organization

S.No	ERP systems and their effects on organization	$\bar{X}$	S.D	Statistical Inference
1.	**ERP systems on sale unit**			
	Male **(N:65)**	18.1692	2.12551	**t =8.737** df=78 p < 0.001 **Significant**
	Female **(N:15)**	23.1333	1.12546	
2.	**ERP systems on the planning units**			
	Male **(N:65)**	21.1538	1.88937	**t =7.694** df=78 p < 0.001 **Significant**
	Female **(N:15)**	24.9333	.25820	
3.	**ERP systems on production unit**			
	Male **(N:65)**	22.7231	2.91820	**t =7.236** df=78 p < 0.001 **Significant**
	Female **(N:15)**	28.2667	.96115	

4.	**ERP systems on Inventory and warehouse unit**			
	Male **(N:65)**	17.6769	1.63083	**t =7.613** df=78 p < 0.001 **Significant**
	Female **(N:15)**	21.1333	1.35576	
5.	**ERP systems on accounting unit**			
	Male **(N:65)**	18.7538	2.05419	**t =7.221** df=78 p < 0.001 **Significant**
	Female **(N:15)**	22.8000	1.42428	
6.	**ERP systems and their effects on organization**			
	Male **(N:65)**	99.5231	7.96302	**t =7.480** df=78 p < 0.001 **Significant**
	Female **(N:15)**	115.73	5.39135	

Table 2: There is a significant difference between respondents' Gender and various dimensions of ERP systems and their effects on organization such as ERP systems on sale unit, ERP systems on the planning units, ERP systems on production unit, ERP systems on Inventory and warehouse unit and ERP systems on accounting unit.

Table 3:'t' test between respondents' educational qualification and various dimensions of ERP systems and their effects on organization

S.No	ERP systems and their effects on organization	$\bar{X}$	S.D	Statistical Inference
1.	**ERP systems on sale unit**			
	Post Graduation **(N:34)**	16.8824	2.12866	**t =8.467** df=78 p < 0.001 **Significant**
	Professional **(N:46)**	20.7391	1.92567	
2.	**ERP systems on the planning units**			
	Post Graduation **(N:34)**	19.8529	1.37361	**t =10.634** df=78 p < 0.001 **Significant**
	Professional **(N:46)**	23.3478	1.50875	
3.	**ERP systems on production unit**			
	Post Graduation **(N:34)**	21.2059	3.20775	**t =7.431** df=78 p < 0.001 **Significant**
	Professional **(N:46)**	25.6522	2.14183	
4.	**ERP systems on Inventory and warehouse unit**			
	Post Graduation **(N:34)**	16.7353	1.67529	**t =7.789** df=78 p < 0.001 **Significant**
	Professional **(N:46)**	19.5000	1.48698	
5.	**ERP systems on accounting unit**			
	Post Graduation **(N:34)**	17.7353	2.20617	**t =6.842** df=78 p < 0.001 **Significant**
	Professional **(N:46)**	20.8261	1.82944	

6.	**ERP systems and their effects on organization**			
	Post Graduation **(N:34)**	95.0294	7.85661	**t =7.791** df=78
	Professional **(N:46)**	108.13	7.11058	p < 0.001 **Significant**

Table 3: There is a significant difference between respondents' educational qualification and various dimensions of ERP systems and their effects on organization such as ERP systems on sale unit, ERP systems on the planning units, ERP systems on production unit, ERP systems on Inventory and warehouse unit and ERP systems on accounting unit.

Table 4:**'t' test between the respondents' marital status and various dimensions of ERP systems and their effects on organization**

S.No	ERP systems and their effects on organization	$\bar{X}$	S.D	Statistical Inference
1.	**ERP systems on sale unit**			
	Married **(N:70)**	18.4571	2.31370	**t =8.467** df=78
	Unmarried **(N:10)**	23.6000	.84327	p < 0.001 **Significant**
2.	**ERP systems on the planning units**			
	Married **(N:70)**	21.4143	2.05358	**t =10.634** df=78
	Unmarried **(N:10)**	25.0000	.000001	p < 0.001 **Significant**
3.	**ERP systems on production unit**			
	Married **(N:70)**	23.0714	3.08489	**t =7.431** df=78
	Unmarried **(N:10)**	28.6000	.96609	p < 0.001 **Significant**
4.	**ERP systems on Inventory and warehouse unit**			
	Married **(N:70)**	17.8429	1.68227	**t =7.789** df=78
	Unmarried **(N:10)**	21.7000	1.33749	p < 0.001 **Significant**
5.	**ERP systems on accounting unit**			
	Married **(N:70)**	18.9286	2.08042	**t =6.842** df=78
	Unmarried **(N:10)**	23.6000	.96609	p < 0.001 **Significant**
6.	**ERP systems and their effects on organization**			
	Married **(N:70)**	100.29	8.15456	**t =7.791** df=78
	Unmarried **(N:10)**	118.50	4.42844	p < 0.001 **Significant**

Table 4: There is a significant difference between respondents' marital status and various dimensions of ERP systems and their effects on organization such as ERP systems on sale unit, ERP systems on the planning units, ERP systems on production unit, ERP systems on Inventory and warehouse unit and ERP systems on accounting unit.

Table 5: **'t' test between the respondents' type of Management and various dimensions of ERP systems and their effects on organization**

S.No	ERP systems and their effects on organization	$\bar{X}$	S.D	Statistical Inference
1.	**ERP systems on sale unit**			
	Top management **(N:25)**	16.8400	2.46103	**t =5.863** df=78 p < 0.001 **Significant**
	Middle management **(N:55)**	20.1273	2.26122	
2.	**ERP systems on the planning units**			
	Top management **(N:25)**	19.6000	1.50000	**t =8.173** df=78 p < 0.001 **Significant**
	Middle management **(N:55)**	22.8909	1.73923	
3.	**ERP systems on production unit**			
	Top management **(N:25)**	20.6400	3.58097	**t =6.917** df=78 p < 0.001 **Significant**
	Middle management **(N:55)**	25.1818	2.23682	
4.	**ERP systems on Inventory and warehouse unit**			
	Top management **(N:25)**	16.6400	1.95533	**t =5.813** df=78 p < 0.001 **Significant**
	Middle management **(N:55)**	19.0909	1.64736	
5.	**ERP systems on accounting unit**			
	Top management **(N:25)**	17.6400	2.58005	**t =5.181** df=78 p < 0.001 **Significant**
	Middle management **(N:55)**	20.3636	1.97544	
6.	**ERP systems and their effects on organization**			
	Top management **(N:25)**	94.5200	9.15205	**t =5.875** df=78 p < 0.001 **Significant**
	Middle management **(N:55)**	106.22	7.82373	

Table 5: There is a significant difference between respondents' type of management and various dimensions of ERP systems and their effects on organization such as ERP systems on sale unit, ERP systems on the planning units, ERP systems on production unit, ERP systems on Inventory and warehouse unit and ERP systems on accounting unit.

Table 6: **One way analysis of variance among the respondents' department with regard to various dimensions of employee commitment and job satisfaction**

S.NO	Source	Df	SS	MS	$\bar{X}$	Statistical Inference
1.	**ERP systems on sale unit**				G1=16.7931	**F=46.190**

	Between Groups Within Groups	4 75	431.886 175.314	107.971 2.338	G2=18.2000 G3=20.0000 G4=21.2857 G5=23.5455	P < 0.001 **Significant**
2.	**ERP systems on the planning units** Between Groups Within Groups	 4 75	 340.110 63.377	 85.028 .845	G1=19.6552 G2=21.0000 G3=23.2222 G4=24.4286 G5=25.0000	**F=100.621** P < 0.001 **Significant**
3.	**ERP systems on production unit** Between Groups Within Groups	 4 75	 582.671 349.817	 145.668 4.664	G1=20.8966 G2=23.2000 G3=24.6667 G4=27.0000 G5=28.5455	**F=31.231** P < 0.001 **Significant**
4.	**ERP systems on Inventory and warehouse unit** Between Groups Within Groups	 4 75	 223.505 118.045	 55.876 1.574	G1=16.6897 G2=17.6667 G3=18.8889 G4=20.0000 G5=21.5455	**F=35.501** P < 0.001 **Significant**
5.	**ERP systems on accounting unit** Between Groups Within Groups	 4 75	 311.320 186.668	 77.830 2.489	G1=17.6897 G2=18.4667 G3=20.3333 G4=21.0000 G5=23.4545	**F=31.271** P < 0.001 **Significant**
6.	**ERP systems and their effects on organization** Between Groups Within Groups	 4 75	 5244.247 2423.441	 1311.062 32.313	G1=94.7241 G2=98.4667 G3=106.39 G4=110.00 G5=117.82	**F=40.574** P < 0.001 **Significant**

G1= Marketing, G2= Finance, G3= Sales, G4= R & D and G5= Production

Table 6: There is a significant variance among the respondents' department with regard to various dimensions of ERP systems and their effects on organization such as ERP systems on sale unit, ERP systems on the planning units, ERP systems on production unit, ERP systems on Inventory and warehouse unit and ERP systems on accounting unit.

Table 7: Multiple regression analysis for ERP systems on planning unit, ERP systems on Inventory and warehouse, ERP systems on accounting unit and ERP systems and their effects on organization

S. no	Variable	B	Beta	t	Sig.
1.	ERP systems on the planning units	0.679	0.156	**5.186**	**.000**
2.	ERP systems on Inventory and warehouse unit	1.157	0.244	**5.632**	**.000**
3.	ERP systems on accounting unit	2.234	0.569	**11.715**	**.000**
	R=0.994	R^2=0.988	Adjusted R=0.987		
	F=1228.0	**P< 0.001**			

Table 6: There is a significant relationship between ERP systems on planning unit, ERP systems on Inventory and warehouse, ERP systems on accounting unit and ERP systems and their effects on organization.

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IV. FINDINGS AND SUGGESTIONS

Findings based on socio-demographic profile

1. More than half (i.e.) 53.8 per cent of the respondents were in the age group of 31 to 40 years.
2. Highly majority (i.e.) 81.2 per cent of the respondents were male.
3. More than half (i.e.) 57.5 per cent of the respondents were Professional.
4. High majority (i.e.) 87.5 per cent of the respondents were married.
5. More than half (i.e.) 58.8 per cent of the respondents received monthly income of Rs.40001 to Rs.60000.
6. Majority (i.e.) 68.8 per cent of the respondents belong to middle management.
7. One-third **(**i.e.) 36.2 per cent of the respondents were working in marketing department.

Findings based on Low and high level of various dimensions of ERP systems and their effects on organization

1. More than half (i.e.) 52.5 per cent of the respondents had high level with regard to ERP systems on sale unit.
2. Exactly half (i.e.) 50.0 per cent of the respondents got high level and 50.0 per cent of the respondents got low level with regard to ERP systems on the planning unit.
3. More than half (i.e.) 53.8 per cent of the respondents obtained high level with regard to ERP systems on production unit.
4. Majority (i.e.) 65.0 per cent of the respondents had high level with regard to ERP systems on inventory and warehouse unit.
5. Majority (i.e.) 61.3 per cent of the respondents got high level with regard to ERP systems on accounting unit.
6. More than half (i.e.) 53.8 per cent of the respondents obtained high level with regard to ERP systems and their effects on the organization.

Findings based on the Research hypothesis

1. There is a significant correlation between respondents' age and various dimensions of ERP systems and their effects on organization.
2. There is a significant difference between respondents'gender and various dimensions of ERP systems and their effects on organization.
3. There is a significant difference between respondents' educational qualification and various dimensions of ERP systems and their effects on organization.
4. There is a significant difference between respondents' marital status and various dimensions of ERP systems and their effects on organization.
5. There is a significant difference between respondents' type of management and various dimensions of ERP systems and their effects on organization.
6. There is a significant variance among the respondents' department with regard to various dimensions of ERP systems and their effects on organization.
7. There is a significant relationship between ERP systems on planning unit, ERP systems on Inventory and warehouse, ERP systems on accounting unit and ERP systems and their effects on organization.

Suggestions

1. Organization must foresee the feasibility of the ERP system implementation before bringing it on the table.
2. Organization must conduct a market research and develop the software specific to the targeted requirements.
3. Organization should necessitate skilled man power, it is imperative for the organizations initiate the training programs which enhance the understanding of ERP requirement properly.
4. Use the intervention of the skilled and professional technician in the implementation of ERP to preventing drain brain.
5. Organization should ensure network support, deploying of adequate server/network, even during the training/modeling phase and introducing new PCs with latest configuration.
6. Government should encourage the organization for the implementation of ERP to enhance their performance.
7. Organization should be more concerned with synergy among the technological and implementation factors because that is where the real benefits can be found.
8. Focus on building a teamwork environment where team size spans across the entire organization. ERP training should be carried out across the organization about ERP achievement and failure practices.
9. Taking into account the most important needs of the implementation; the overall ERP architecture should be established well before the deployment. To facilitate the process; rigorous and sophisticated software testing ought to be performed.
10. The ERP team should consist of 'Best and brightest brains' in the organization. It ought to include cross- utilitarian expertise and a blend of inner staff and the external consultants. The amount of interaction between them makes the contributing element for the achievement of the project.

V. CONCLUSION:

This paper aims to analyse the ERP systems and their effects on the organization in selected construction chemical companies at Chennai in Tamil Nadu. ERP systems have a desirable impact on different units: On the sales unit, the greatest impact is related to customers and thus when this system is implemented the customers are provided with services and goods as soon as possible. ERP system provides planning unit with timely information, so the staff of this unit will be able to do control and planning activates more easily. It also has had a positive effect on production unit. ERP system makes it possible to access inventory turnover in warehouse control unit, increasing dominance on it. With this system, preparation of financial statements, which is very time consuming task requiring high precision, is done rapidly and accurately and since accounting records are systematically performed in different section of the organization. Organizations should provide opportunities to enhance the skills of the employees by providing training opportunities on a continuous basis to meet the changing needs of the business and employees. Organization should periodically evaluate the performance indicators in the study, benchmark the results with the expected satisfaction levels and diagnose which factors are problematic

and need further consideration. Organisations that have future designs will form a clear understanding of business requirement, gain more vision and acquire ability to expand knowledge and skills to better assimilate and utilize ERP system and therefore minimize the risks associated with this particular investment.

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