

ESPOUSAL AND ASSESSMENT OF ELECTRONIC PROCUREMENT: A STUDY OF SELECT PHARMACEUTICAL COMPANIES

Abstract

The pharmaceutical industries are the most important and revenue-generating industries for decades, pharma industries are now witnessing challenges in global competition. The revamping of their business structures in these days has undergone tremendous transformation due to globalization, market competition, supply chain lead time, cost optimization and technological advancement for survival and sustainability. Hence the use of advanced technologies to share information and work effectively becomes a necessity. These changes shifted the pharmaceutical supply chain from operational functions to value-added activities and long-term sustainability. This realization led to the espousal of electronic procurement in pharma companies. E- Procurement is not an option but a necessity to sustain business even in the highly competitive pharmaceutical sectors. This study aims to figure out various parameters impacting the espousal of e-procurement in pharmaceutical companies and further extended to find parameters of the assessment of this espousal. Additionally, the final objective of this study is to develop an integrated framework for the espousal and assessment of e-procurement in the pharmaceutical sector. This framework will help to conceptualize and design a new era in the procurement of the pharmaceutical sector which will make purchasing more economical, efficient and effective thus in turn making the profits from its operations.

Keywords: E-Procurement, Pharmaceutical, Electronic procurement; Espousal, Assessment.

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I. INTRODUCTION

The global pharma market has grown from \$1454.66 billion in 2021 to \$1587.05 billion in 2022 at a compound annual growth rate of 9.1% (CAGR). The growth is due to the rearranging of operations of the pharma industries. The market is expected to reach \$2135.18 billion in 2026 of 7.7% of CAGR. It consists of sales of pharmaceuticals by organizations used for medical purposes in treating diseases. According to WHO, by 2030, the population of most countries one of every six people on the planet will be 60 or older. The population aged 60 and above will rise from 1 billion in 2020 to 2.2 billion by 2050. The increase in the patient pool drove the demand for pharmaceuticals used in the treatment of diseases significantly impacting the market growth during this period. Pharmaceutical and health sectors are very unique which involve huge expenditures, a range of stakeholders and people and also the dominance of Government and procurement policy implications to be considered [2]. E-procurement procedure in the pharma industry is peculiar in nature and is highly influenced by the nature of the manufacturing process need, buying and selling of materials and other initiatives to handle the procurement cycle. This initiative helps to reduce the cost, and lead time, fight competition and requirement planning become feasible.

E-procurement in the pharma industry is highly influenced by the nature of its products, manufacturing process needs, buying and selling of materials and other initiatives for handling the procurement cycle. This enhanced emphasis was laid on the implantation of e-procurement in the pharma industry. This implementation includes sources like trends in the market, information on competition, information on trending legal and regulatory changes, data on the capacity of suppliers, news of mergers and acquisitions. Featuring this gap and industry needs, this research study tends in finding parameters which are crucial for the espousal of e-procurements and parameters which are essential for the assessment of such espousal and to provide the integrated framework for the espousal and assessment of e-procurement in the pharma industry. This integrated framework demonstrates the potential of e-procurement adoption for the pharmaceutical industry to conceptualize and redesign their procurement process. The assessment of espousal can be used by the industry to measure the success of the e-procurement system. It also helps users to figure out areas to be improved upon the system to be more effective, efficient and productive.

II. LITERATURE REVIEW

Moving towards the "future of procurement" it is necessary to understand the value of E-procurement which moves from a bureaucratic model to a virtual model that is informal and electronic. E-procurement is very important and essential as it makes purchasing activities more effective in terms of both cost and time which in turn help the Indian Industries to grow and compete in the global area [6]. The quantifiable amount of return on investment made by the usage of electronic platforms for the procurement of pharmaceuticals and medical devices in the government of Chile in terms of return on investment on the electronic platform [3]. E-procurement is not widely adopted due to the barriers like resource constraints, technology, legal and government environments. Efforts from all stakeholders including employees, vendors, system developers and government to overcome these barriers [1]. Green procurement adoption in the public sector of Tanzania is recommended to involve all parties to get the true potential and benefits of e-procurement. This can be achieved through training and legal frameworks which govern the system and the benefits to the

supplier and the government [4] IT infrastructure, managerial commitment, public procurement regulations and employee competencies had a significant impact on the successful completion of e-procurement in procuring entities at the country level in Kenya [5]. The benefits related to e-procurement are overpowering the risks and risks are diminished with the passage of time and more companies' implementation in the future. Cost reduction was acknowledged as the most important benefit with e-procurement in the Swedish and Indian Firms [7]. The impact of the espousal of e-procurement on strategic procurement decision-making and found that the increase of communication volume between supplier and the buyer, integration with a supplier system, price reduction, reduces transactional cost, supplier resistance supports, strategic procurement decision-making impacted positively with the espousal of e-procurement [8]. E-procurement automation benefits during Covid 19 pandemic and revealed that implementing the e-procurement system led to benefits to all level of an organization, e-procurement system offers improved speed visibility and control and help finance officers match purchases with purchase order, receipt and job tickets. Further, the study concluded that in case of government procurement efficiency, transparency, equity fairness and encouragement of local business might be the benefits of e-procurement automation. Because of easier accessibility and openness of the internet, more people can attain earlier information which increases transparency [9]. The company performance has been positively impacted due to e-procurement adoption in the way of improved efficiency, increased sales performance, improved customer satisfaction and improved relationship development [10].

From the above literature reviews, there are limited risks involved in the espousal of e-procurement benefits to employees and organizations and the risks are diminishing when year passes by improving the critical success factors. Also find out different assessment parameters of e-procurement scenarios. There are various expected results seen from the related studies of espousal parameters are critical parameters to the assessment. These are the parameters which are kept as benchmark or achievable targets of assessment of e-procurement. Profits, lead time and improvement in efficiency, effectiveness and productivity etc. are the expected results seen from the related studies of espousal parameters.

III. METHODOLOGY

1. **Research Design:** In this study, the judgemental sampling or purposive sampling technique was adopted by the researcher. It is a non-probability sampling technique in which the respondents were chosen based on the merit level of e-procurement initiative knowledge along with the willingness to provide the required information. The research study was carried out with the pharmaceutical companies located in Telangana, Karnataka and Tamil Nadu states of India.
2. **Collection of Data:** The success of the research study depends mainly on the nature of the tools and techniques employed. The following tools were administered for collecting data for the present study.
 - **Questionnaire:** All the users of e-procurement systems in all pharmaceutical companies were the respondents to the questionnaire. The questionnaire was basically divided into two parts. The first part of a questionnaire aimed at collecting the

espousal parameters which affect the adoption of e-procurement from the viewpoint of benefits, barriers, critical success factors, intention to use and user satisfaction. The second part of a questionnaire aimed at collecting the assessment parameters which are the outcomes of the espousal of e-procurement from the viewpoint of improved services, cost optimization and process improvement. The questionnaire mainly consisted of closed-ended questions, and the responses for the questions were on the "five points" Likert scale. The Likert scale stated the opinion and identifies the respondent's degree of agreement or disagreement towards the acceptance level and was very popularly used because of its simplicity and convenience to respondents. The number of parameters considered in this part against which the respondents were requested to provide their answers by ticking against each espousal parameter based on their level of acceptance as 5-strongly agree, 4 -agree, 3- uncertain, 2-disagree and 1-totally disagree

- **Semi-Structured Interview:** Non- standardized and semi-structured interviews had been chosen in order to stick to the area of research. The interview questions were designed to collect the respondent details such as the name of the respondents, designation of the respondent, year of experience of respondent and type of company in which the respondent is working now. The selection of the respondents for the interviews had been made based on convenient sampling. The IT developer, head of procurements and head of supply chains were the respondents of the interviews in all three selected pharmaceutical companies. The responses are collected by the researcher in person and over the phone by interviewing the respondents against each question and recorded for further analysis.

3. Statistical Techniques Used: Descriptive statistical tools were used in the analysis of primary data like frequency, percentage, mean and mean ranking by using the **statistical software Minitab-17** to represent the data set and arriving a sensible conclusion. This analysis was used in identifying the trend and a pattern in the collected data from the sample which represents the overall population.

- **Frequency:** The study of quantitatively describing the characteristics of a set of data is called descriptive statistics. Frequency is the number of times of occurrence of an event which is an important area of statistics.
- **Percentage:** Percentage is calculated by taking the frequency divided by the total number of participants and multiplying by 100%. In this study, the frequency of the parameters was converted to the corresponding percentage. Percentage analysis is one step ahead of frequency analysis.
- **Mean:** The mean or the average is calculated by adding all the figures within the data set and then dividing by the number of figures within the set. The mean used to analyse the level of acceptance of espousal and assessment parameter.
- **Mean Rank:** The mean rank is the average of the ranks within each sample. The mean rank is used in this study to compare with the parameters from the rank table.

IV. RESULTS AND DISCUSSION

1. Espousal Parameters of E-Procurement: The various important parameters which impact over the espousal of e-procurement in pharmaceutical companies are grouped as the key dimensions to analyze and interpret the user acceptance level of e-procurement in the select pharmaceutical companies of Telangana, Karnataka and Tamil Nadu states. The list of parameters for the espousal of e-procurement is bifurcated into the following five categories as Benefits, Barriers, critical success factors, intention to use and user satisfaction

- Benefits:** There are some expected benefit parameters that relate to the espousal of e-procurement in pharmaceutical companies and the following 54 important key benefit parameters are taken for analysis. These key expected parameters, if achieved by an organization, will be considered as a profit to the organization. A detailed analysis has been made by calculating the mean score, frequency and percentage of respondents' acceptance level with each benefit parameters. The average mean score of responses to benefit parameters perceived by the entire 150 respondents of all pharmaceutical companies is 3.949. This mean score indicates that almost all the responses level lying between "agree and strongly agree". about overall 8100 responses of the entire 150 respondents from all states towards perceived benefits. Out of which 2265 responses (28%) are strongly agreed and 4159 responses (51%) are agreed with the perceived benefits during the implementation of e-procurement in the pharmaceutical companies of all states. Whereas 937 responses (12%) are uncertain, 415 responses (5%) are disagreed and only 4% responses are totally disagreed with the perceived benefits. To sum up, with a greater extent overall 79% of responses are agreed towards the perceived benefits of implementing an e-procurement system in their company. Figure 1 clearly tells the mean ranking of perceived benefit parameters that relate to the espousal of e-procurement in pharmaceutical companies. Based on the mean ranking top ten benefit parameters are listed accordingly.

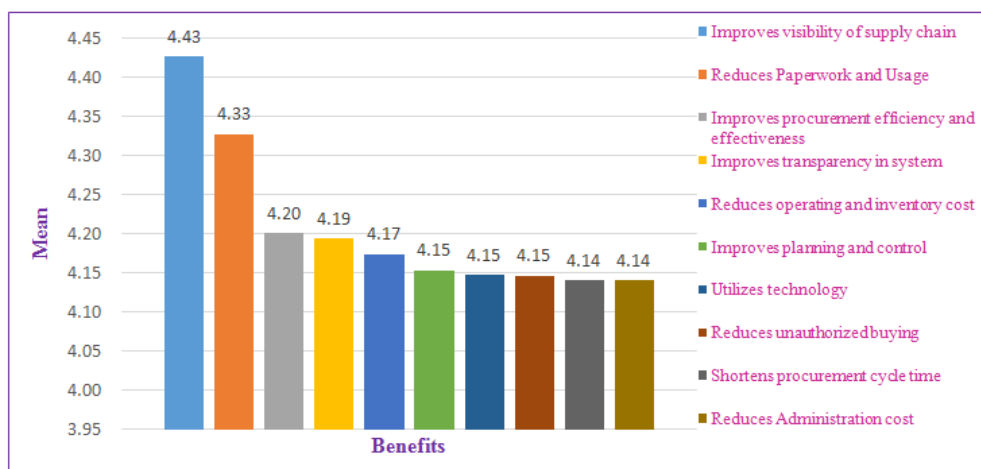


Figure1: Top 10 Benefit Parameters

Improves visibility of the supply chain, reduces paperwork, improves effectiveness and efficiency of procurement, improves transparency, reduces operating and inventory cost, improves planning and control, utilizes technology, reduces unauthorized buying, shortens procurement cycle time and reduces the administration cost are the top ten benefit parameters of espousal of e-procurement in pharmaceutical companies.

- Barriers:** These are some hindering factors which impact the adoption or become a barrier during the implementation of e-procurement and the following 35 important key hindering factors are taken for analysis. These key expected hindering parameters, if overcome by an organization, will be considered as a profit to the organization. A detailed analysis has been made by calculating the mean score, frequency and percentage of respondents' acceptance level with each barrier parameters. The overall average mean value of barriers/challenges parameters faced by the entire 150 respondents of all pharmaceutical companies is 3.522. This overall mean value indicates that all the challenges/barriers faced during the implementation of e-procurement are agreed upon by the entire respondents of the pharmaceutical companies of all states. Figure 4.22 illustrates about the overall 5250 responses of 150 respondents from all states towards barriers. Out of which 835 responses (16%) are strongly agreed and 2159 responses (41%) are agreed, 1149 responses (22%) are uncertain, 1034 responses (20%) are disagreed and only 1% responses are totally disagreed with the challenges faced / barriers negatively impacted over implementation of e-procurement. To sum up, overall, 57% of responses are agreed with the challenges faced/barriers impacted negatively during espousal of the e-procurement in the pharmaceutical companies and only 1% responses not at all faced the challenges. The overall responses' mean ranking of perceived challenges/barriers agreed by respondents are illustrated in figure2. Based on the mean rank value, the top ten barriers are listed accordingly.

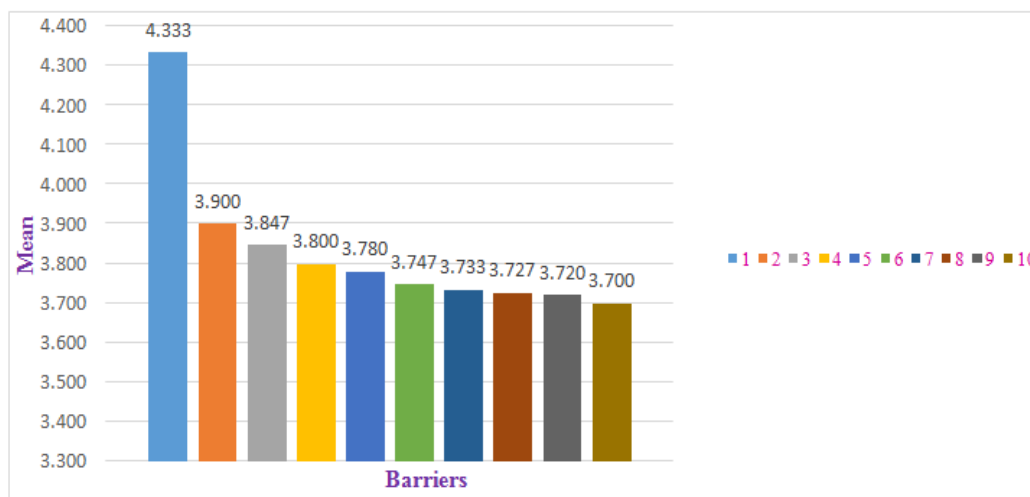


Figure 2: Top 10 Barrier Parameters

Lack of e-procurement knowledge, Lack of supplier e-procurement, Inadequate business processes to support e-procurement, unique company culture,

want of more development time, difficulties in integration between the supplier and manufacturers, high cost of implementation, fear of security, inadequate top management support and high cost of technology are the top ten barriers that impacted negatively during the implementation of e-procurement in pharmaceutical companies of all states

- Critical Success Factors:** There are some critical success factors to be considered for the successful implementation of e-procurement of pharmaceutical companies. Realizing the importance, the following 27 important critical success factors are taken for analysis. A detailed analysis has been made by calculating the mean score, frequency and percentage of responses with each critical success factors. It is evident that the overall mean value for all critical success factors that are being considered for the successful implementation of the e-procurement in all states is 3.999, which clearly indicates with due weightage all critical success factors are being considered during implementation of e-procurement in their organizations. About a total 4050 responses towards critical success factors by the entire 150 respondents from all states. Out of that total 1209 responses (30%) are strongly agreed, 1998 responses (49%) responses are agreed, 512 responses (13%) are uncertain, 292 responses (7%) are disagreed and 39 responses (1%) is totally disagreed with critical success factors. It is observed that 79% of responses are agreed with critical success factors are being considered during the implementation of e-procurement in the pharmaceutical companies of all states.

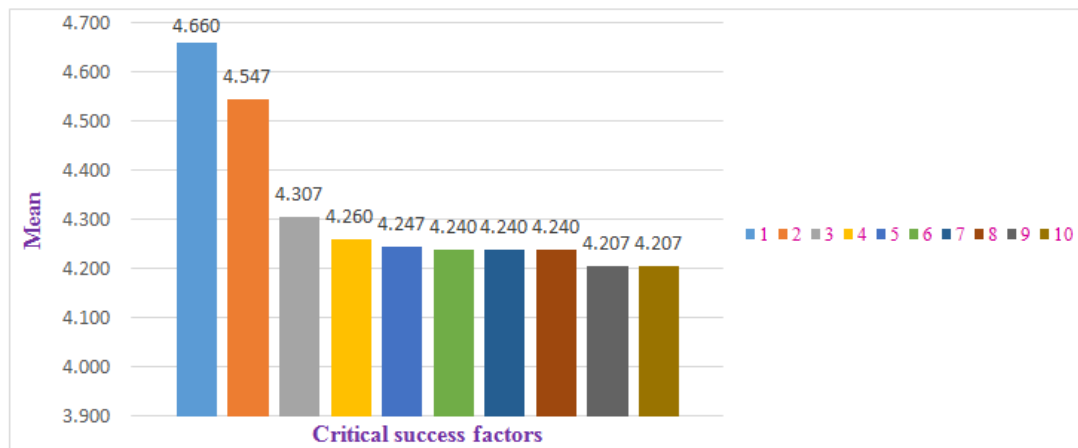


Figure 3: Top 10 Critical success factor

Figure 3 shows the overall top ten mean rank value of responses towards critical success factors. Based on the overall mean rank value, the top ten critical success factors being considered while the implementation of e-procurement are figured out accordingly. Management support, Capability of staff on adoption, Strategic use of staff, Availability of proper environment where being implanted, Strategy of implementation, Training to the employee, top management involvement, initial training on the e-procurement, skilled labour to use e-procurement and

information security are the top ten critical success factors being considered during implementation of e-procurement in the pharmaceutical companies of all states

- Intention to Use:** Intention to use describes the willingness or density of the usage of the system such as requirement planning, receipt of internal support and the company's opinion on using the virtual learning environment. There are some parameters of intention to use e-procurement of pharmaceutical companies. Realizing priority following 5 important intentions to use parameters are taken for analysis. A detailed analysis has been made by calculating the mean score, frequency and percentage of responses with each intention to use parameter. The overall mean value of intention to use e-procurement in all states is 4.016, which clearly indicates that all intention to use parameters are being agreed with the implementation of e-procurement in their organizations. Total of 750 responses from the entire 150 respondents towards intention to use parameters. From that total 173 responses (23%) are strongly agreed, 458 responses (61%) are agreed, 77 responses (10%) are uncertain and 42 responses (6%) are disagreed. However, no responses are totally disagreed with the intention to use e-procurement in the pharmaceutical companies of all states. Table 4.28 talks about the mean ranking on the intention to use e-procurement in the pharmaceutical companies of all states. Based on the internal organization support received, Integration with supplier electronic system and perceived improvement/convenience to purchasing tasks, overall rank value of more than 4.000 towards intention to use e-procurement in the pharmaceutical companies of all states are listed in Table 1

Table 1: Intention to Use Parameters with Mean Rank more than 4.000

S.No	Parameters	Mean
1	Receives Internal organizational support	4.38
2	Integration with supplier electronic system	4.14
3	Perceived improvement / Convenience to purchasing tasks	4.066

- User Satisfaction:** The user gets satisfied when the system provides evidence of expertise while using the virtual learning environment, and perceives usefulness and ease of work execution. There are some user satisfaction parameters while implementing e-procurement of pharmaceutical companies. Realizing user satisfaction priority, the following 9 important user satisfaction parameters are taken for analysis. A detailed analysis has been made by calculating the mean score, frequency and percentage of responses with each user satisfaction parameter. The overall mean value of user satisfaction is 4.213, which clearly indicates that all user satisfaction parameters are agreed with the implementation of e-procurement in their organizations of all states. About the total 1350 responses were provided by the entire 150 respondents towards user satisfaction parameters. Out of that total 499 responses (33%) are strongly agreed, 754 responses (56%) are agreed, 134 responses (10%) are uncertain, 12 responses (1%) are disagreed and only one response totally disagreed with user satisfaction during implementation of e-procurement in pharmaceutical

companies of all states. It is concluded that 89% of responses in relates to user satisfaction are in agreed level of acceptance.

Table 2 represents the overall response's average mean ranking on the user satisfaction of all states. The average mean ranking score of more than 4.000 are figured out and listed accordingly. When satisfied with the exchange of knowledge, with more reliability of the system, when they show involvement, when they receive infra-structural support, when they perceive usefulness, when they perceive ease of use, when training provided to them, with increased computer self-efficacy and while ensuring the accurate and on-time delivery are the 9 user satisfaction parameters ensured during the implementation of e-procurement in pharmaceutical companies of all states.

Table 2: User Satisfaction Parameters with Mean Rank more than 4.000

S.No	Parameters	Mean
1	When satisfied with Exchange of knowledge	4.400
2	With more Reliability of system	4.286
3	When Employee shows involvement	4.260
4	When receives Infra structural support	4.220
5	When the employee Perceives usefulness	4.180
6	When the employee Perceives ease of use	4.180
7	When training provided to the employee	4.173
8	With the increased Computer self-efficacy	4.173
9	While ensuring accurate and on time delivery	4.046

2. Assessment Parameters of E-Procurement: The various important parameters which impact over the post espousal of e-procurement in pharmaceutical companies are grouped under improved services, cost optimization and process efficiencies. The list of parameters for assessment of e-procurement is bifurcated into the following three categories as Improved services, cost optimization and Process improvement

- **Improved Services:** There are some parameters achieved by the users for the improvement in the services of post-implementation of e-procurement in pharmaceutical companies. Certain essential improved service parameters considered for analysis are listed below. A more detailed analysis has been carried out by calculating the average mean, number of responses and percentage of responses of improved services.

The improved services sensed on the post espousal of e-procurement in pharmaceutical companies of all states are tabulated in 4.45. The overall mean value for improved services sensed on the post espousal of the e-procurement in pharmaceutical companies of all states is 4.044. It concludes that all the responses are agreed with improved services on the post espousal of e-procurement in pharmaceutical companies of all states. Figure 4 clearly illustrates about the 5250 total responses elicited by the entire 150 respondents towards improved services.

From that total 1630 responses (31%) are strongly agreed, 2594 responses (49%) are agreed, 660 responses (13%) are uncertain, 363 responses (7%) are disagreed and only 3 responses (0%) are strongly disagreed with improved services on the post espousal of the e-procurement in pharmaceutical companies Telangana, Karnataka and Tamil Nadu states.

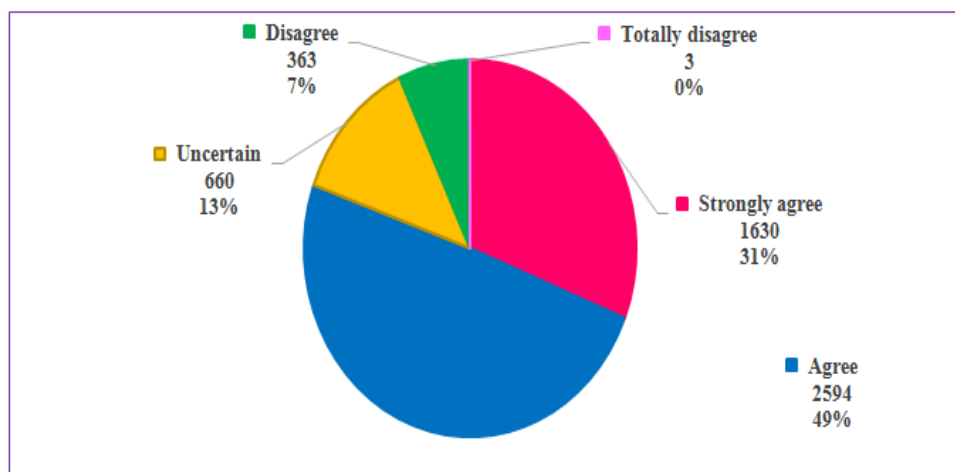


Figure 4 : Improved ServicesParameters

The mean rank value with more than 4.000 are identified and tabulated in 4.46. The following 23 parameters with more than 4.000 mean rank value are considered as agreed with improved services on post implementation of e-procurement in their pharmaceutical companies of all states.

Table 3: Improved Service Parameters with Mean Rank more than 4.000

S.No	Parameters	Mean
1	Increase in efficiencies	4.346
2	Reduces Errors in Transactions	4.340
3	Improves Information Quality	4.326
4	Improves Usage Level	4.326
5	Enhances Better interaction with the business partners	4.300
6	Improves Management Information Benefits	4.293
7	Enhances company brand and corporate image	4.246
8	Increases efficiency with business partners	4.226
9	Improves in Transparency	4.220
10	Creates more awareness of products/services	4.180
11	Increases accessibility to the end users	4.133
12	Provides market access to new market	4.113
13	Improves Buyer Services	4.080
14	Higher the Degree of Accuracy	4.073
15	Reduces the Cycle Time	4.060

16	Fairness the business	4.060
17	Access to better information	4.060
18	Facilitates shipment tracking	4.033
19	Increases response from the end users	4.033
20	Faster response time to the enquiry	4.026
21	Higher the Delivery of Products/Services to The Market	4.020
22	Provides better information for management decision making	4.013
23	Enhances Market expansion	4.006

3. Cost Optimization Parameters: There are some parameters related to cost optimization on post espousal of e-procurement in pharmaceutical companies. Certain essential cost optimization parameters considered for analysis are listed below. A more detailed analysis has been carried out by calculating the average mean, number of responses and percentage of responses towards cost optimization on post espousal of e-procurement. The cost optimization on the post espousal of the e-procurement in pharmaceutical companies of all states. The overall mean value for cost optimization on the post espousal of the e-procurement in pharmaceutical companies of all states is 4.204. It concludes that all the responses are agreed with cost optimization parameters on the post espousal of e-procurement in pharmaceutical companies of all states.

Figure 5 depicts the overall 2100 responses elicited by the entire 150 respondents towards cost optimization on post espousal of e-procurement in pharmaceutical companies of all states. Out of which 68 responses are strongly agreed, 67 responses are agreed, 15 responses are uncertain and none disagreed or totally disagreed on the observation of the cost optimization on the purchasing process. To sum up, Descriptive analysis done on pharmaceutical companies revealed that 46% (955) respondents are sensed by the respondents towards cost optimization at a strongly agreed level, 44% (933) responses are agreed, only 10% (212) responses are uncertain and none either disagreed or disagreed with cost optimization on the e-procurement post espousal in pharmaceutical companies of Telangana, Karnataka and Tamil Nadu.

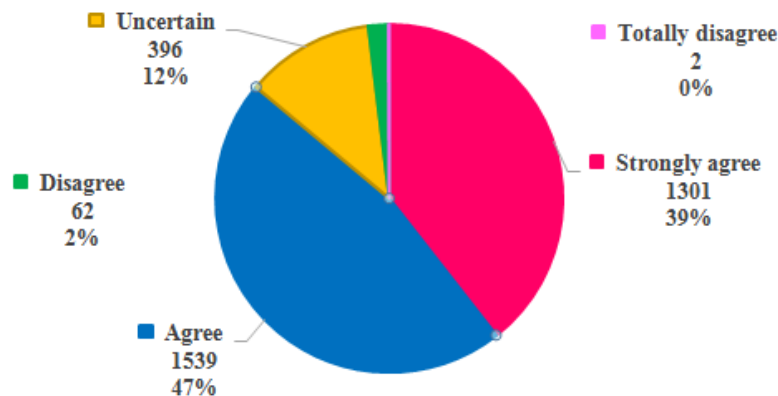


Figure 5: Cost Optimization Parameters

The cost optimization parameters with a mean rank value of more than 4.000 are identified and tabulated in 4. The following 14 parameters with the mean rank value of more than 4.000 are considered as agreed with cost optimization on post-implementation of e-procurement in their pharmaceutical companies of overall states.

Table 4: Cost Optimization Parameters with Mean Rank more than 4.000

S.No	Parameters	Mean
1	Invites more Competitive Bids	4.724
2	Reduces Paperwork	4.703
3	Improves Compliance	4.562
4	Reduces manpower Errors	4.441
5	Enables Improvement in Product Price	4.407
6	Improves Transaction Cost	4.388
7	Reduces Inventory Holding Cost	4.21
8	Increases in profit	4.125
9	Reduces Contract Cost	4.116
10	Reduces Ordering Cost	4.073
11	Reduces administrative cost	4.061

4. Process Improvement Parameters: Parameters that bring improvement in purchasing activities or in the procurement process are considered as process improvement parameters. For the analysis of the study, certain process improvement parameters listed below are taken for analysis. A more detailed analysis has been carried out by calculating the average mean, number and percentage of Improves business process flow. The overall mean value of responses towards process improvement on the post espousal of the e-procurement in pharmaceutical companies of all states is tabulated in 4.63. The overall mean value for process improvement on the post espousal of the e-procurement in pharmaceutical companies of all states is 4. 234. It concludes that all the responses are agreed with process improvement parameters on the post espousal of e-procurement in pharmaceutical companies of Telangana, Karnataka and Tamil Nadu.

Figure 6 illustrates about the overall 3300 responses provided by 150 respondents towards process improvement parameters. Out of which responses (39%) are strongly agreed, 1539 responses (47%) are agreed, 396 responses (12%) are uncertain, 62 responses (2%) are disagreed and almost none (only 2 out of 3300 responses) disagreed on the achievement of process improvement on the post espousal of e-procurement in pharmaceutical companies of Telangana, Karnataka and Tamil Nadu states

To sum up, overall, 86% of responses are agreed with process improvement parameters on post espousal of e-procurement in pharmaceutical companies of Telangana, Karnataka and Tamil Nadu states

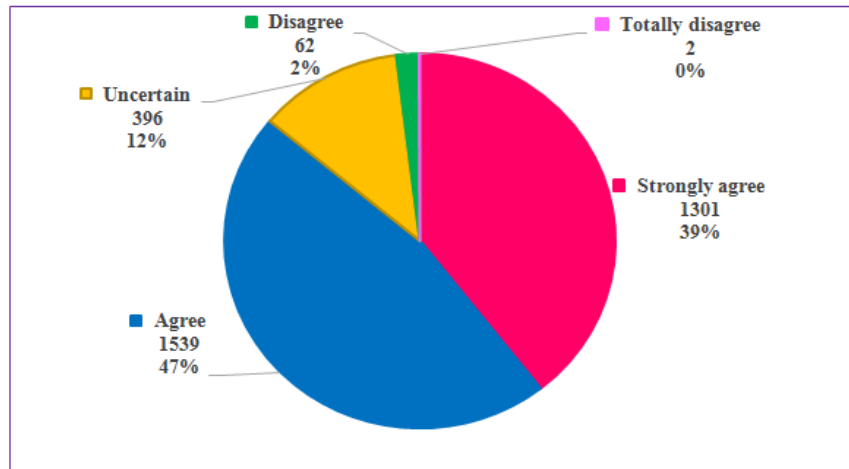


Figure 6 : Process Improvement Parameters

Mean rank values are identified and tabulated in 5. Since the mean rank value is above 4.000, the following 18 parameters are considered as agreed with process improvement on post implementation of e-procurement in their pharmaceutical companies of all states

Table 5: Process Improvement Parameters with Mean Rank more than 4.000

S.No	Parameter	Mean
1	Improves business process flow	4.640
2	Enables Standardization of Procedures	4.493
3	Improves Operational Efficiency	4.433
4	Streamlines the procurement process	4.400
5	Enhances inventory management	4.393
6	Utilizes Procurement Best Practices	4.386
7	Fasten the time to market	4.380
8	Centralizes the Strategic Process	4.373
9	Enables Staff Exposure to new Techniques	4.340
10	Speed up the Processing	4.320
11	Reduces duration in automated process	4.320
12	Improves Coordination, Monitoring and Control	4.306
13	Increases the productivity	4.273
14	Higher the Delivery of Products	4.260
15	Integrates the Entities in a single platform	4.233
16	Improves control of data	4.140
17	Re-engineers the Business Process	4.106
18	Provides Strategic Information	4.093

5. Initial Framework for Espousal and Assessment of E-Procurement: Figure 7 depicts the initial framework for espousal and assessment of e-procurement derived from the case study conducted with selected pharmaceutical companies A, B and C. The responses are recorded and analyzed on both during espousal and assessment post espousal of e-procurement in pharmaceutical companies.

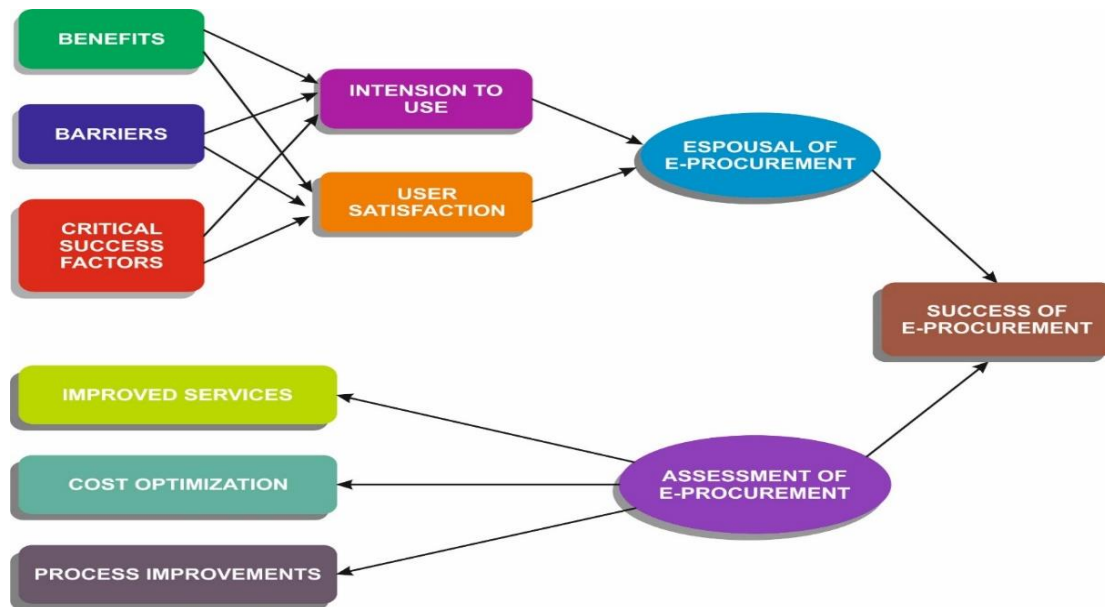


Figure 7 : Initial framework for Espousal and Assessment of E-Procurement

6. Experience Survey with Select Pharma Companies: In the recent era to cope up with technological advancement in the procurement process, pharmaceutical companies are showing keen interest in the implementation of e-procurement. Some pharmaceutical companies are in the process of implementing an e-procurement system and some of the top companies have already implemented the e-procurement system. Experience survey has been conducted with the implementation team consisting of top management and IT team members who are part of the implementation of e-procurement as their purchasing process in selected pharmaceutical companies. The experience survey is conducted to the implementation team with semi-structured interview questions by the author in person and over telephonic conversations. Experience opinions against each question interviewed are recorded. The analysis of the study majorly focused on the implementation of e-procurement and the post espousal of e-procurement.

7. Verification of Framework with Industrial Experts: The initial framework was verified with the industrial experts like top management and IT department implementers of pharmaceutical companies A, B and C who were actively involved in the implementation and assessment of the e-procurements. They had proposed few changes in the espousal stage of e-procurement with change management, supplier and customers' readiness on new IT technology adoption. They further confirmed that they had achieved the benefits during the assessment of e-procurement like improved error-free management information system, improvement in organizational culture and image, improvement in trust between supplier and customer, and IT skill improvements in

employees. Industrial experts have also advised including the feedback system on the failure/lacking during the assessment stage and recommended related modifications to be carried out in accordance with feedback obtained to ensure the maximum success of the implementation of e-procurement.

8. Final Integrated Framework for Espousal and Assessment of E-Procurement: The initial framework for espousal and assessment of e-procurement in pharmaceutical companies is subjected to verification with industry experts. Upon verification, the industry experts have recommended including change management and supplier and customer readiness on the new IT technology adoption in the espousal stage. Improved error-free management information systems, improvement in organizational culture and image, improvement in trust between supplier and customer and IT Skill improvement in employees are recommended by the industry experts to include in the assessment stage. Experts have also advised including the feedback system to trace out failures/lacking during the assessment stage. Based on the feedback, the related modifications were incorporated to re-monitor the performance in the final framework to ensure the maximum success of implementing e-procurement.

The final framework for espousal and assessment of e-procurement in pharmaceutical companies was developed by incorporating the parameters arrived from the extensive literature review, experience survey and experts' verification in the initial framework.

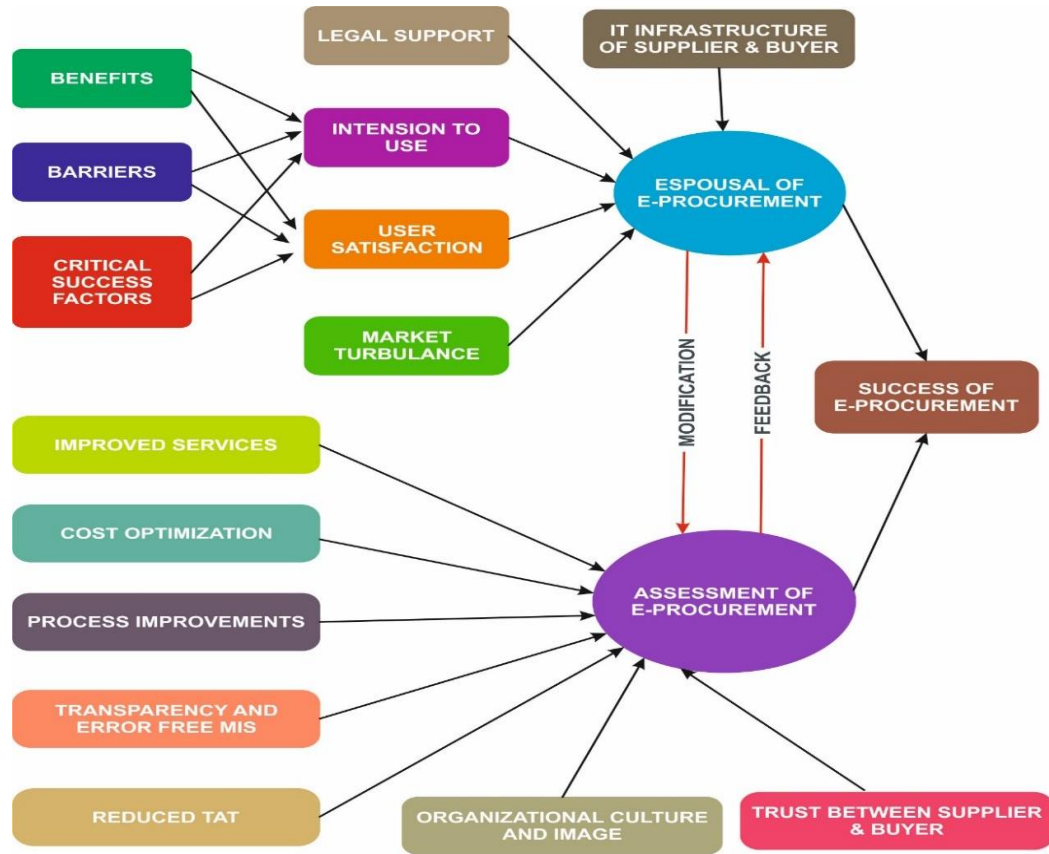


Figure 8: Final Integrated framework for espousal and assessment of e-procurement

The initial framework for espousal and assessment of e-procurement in pharmaceutical companies is subjected to verification with industry experts. Upon verification, the industry experts have recommended including change management and supplier and customer readiness on the new IT technology adoption in the espousal stage. Improved error-free management information systems, improvement in organizational culture and image, improvement in trust between supplier and customer and IT Skill improvement in employees are recommended by the industry experts to include in the assessment stage. Experts have also advised including the feedback system to trace out failures/lacking during the assessment stage. Based on the feedback, the related modifications were incorporated to re-monitor the performance in the final framework to ensure the maximum success of implementing e-procurement.

The final framework for espousal and assessment of e-procurement in pharmaceutical companies was developed by incorporating the parameters arrived from the extensive literature review, experience survey and experts' verification in the initial framework.

V. CONCLUSION

- 1. Managerial Implications:** Based on the study, there are certain implications that can be seen from different perspectives by an industry person. This research study carried out on the pharmaceutical company has much importance as it provides a framework for organizations to conceptualize and redesign their process of procurement. It is also seen that many of the companies have implemented with no fine clear understanding of the importance of e-procurement and supplier relationships. In the same way, very little account has been taken of interdependencies while working on the traditional way of doing procurement. With this framework, if the procurement team understands the correlations of the parameters and feeds it into their strategic decisions will be well placed to see their organizations succeed. Organizations should have a strategy to source any product they plan to manufacture or produce before taking any decision on the implementation of e-procurement. The proposed framework assists in aligning the groups with the capability to provide the best solutions. An initiative step towards an e-procurement solution should be viewed as a vital substance to regulate and to develop competencies of companies' purchase performance. The proposed framework can be used by the industries to evaluate and decide the need for implementation of e-procurement by defining their business needs. In addition to this, the various parameters like benefits, challenges, critical success factors, user satisfaction and their intention can be discussed to have a perfect mechanism implemented. The framework can also be used to measure the success of e-procurement systems implemented within their business settings. It also helps users to figure out the areas which need improvement. The industry players can also decide the best time to switch to new technology based on the legal and government environment and the competition level.
- 2. Suggestions:** The following major suggestions are made from the findings of the study
 - The espousal and assessment framework of e-procurement proposed is widely acceptable with many benefits and the benefits can be realized with proper use of e-procurement.

- The espousal framework can be used by the industry players to evaluate the influence of the parameters like benefits, barriers, critical success factors, intention to use, user satisfaction, legal support, market turbulence and IT infrastructure of buyers and suppliers.
- The espousal framework decides the business need with the usage of e-procurement implementation hence care has to be taken while deciding proper e-procurement solution.
- The assessment framework can be used by the industry players to measure the success of e-procurement systems implemented within their business requirements.
- It also helps the users to figure out the area of operations which needs improvement and to enhance the system to be more effective, efficient and productive.
- The framework can be improved by continuous feedback on the espousal and assessment parameters to make the processes more effective, accurate and also user-friendly.
- The success of the implementation can be improved by organizing training programs on e-procurement from the top level to the operational level.
- The companies can expand e-procurement frameworks put in use in order to optimize the benefits and thus increase the profit.
- The companies can optimize the benefits by increasing the proportion of expenditure on e-procurement and by widening the scope of supplier sourcing.
- The challenges of e-procurement can be overcome by making policies and procedures with top management support.
- E-procurement practices can be utilized significantly for better operational performance in pharmaceutical companies.
- E-procurement can be used to ensure customer satisfaction, reduction in lead times, cost optimization, waste reduction and timely placement of orders.
- The right e-procurement framework can be used in an organization to take the right decision to remain profitable.
- E-procurement can be implemented in the right way for a reduction in ordering error rate and to improve data integrity. Data integrity improves the internal operation of the organization and increases return on investment (ROI)
- E-procurement can be adopted to improve the accuracy of data resulting in an improved decision-making process. Access to accurate data ensures that management can able to react quickly to customer demand improving customer relations
- The e-procurement adoption has the potential of solidifying the relationship with customers resulting in a willingness to take greater risks when it comes to changing existing business practices and customer relations. Hence the organization should adopt e-procurement to maintain good customer relationships.
- Organizations can be benefited by adopting e-procurement technologies as a result of less time being spent by procurement personnel on administrative tasks.
- Companies should utilize the right e-procurement to maintain organizational culture and organizational image
- A periodic audit of the validated framework can be performed to ensure the better performance of the e-procurement system implemented.

- Care must be taken during the development of the framework to ensure the right implementation process of e-procurement to protect the organization from industrial loss. The following major suggestions are made from the findings of the study
- 3. Scope for Future Study:** The research was precisely planned and well executed. Yet there are some scopes to conduct further studies in the future, the following are the scope made for further research study
- Validation of the integrated final framework is needed at the industry level with the development of metrics and measurement rules for assessment of the framework to make it more authenticated measurement tools.
 - The research findings of the study have purely arrived from the responses of the users who are practicing e-procurement. Therefore, it is necessary to know the supplier's views on the application of e-procurement which facilitate coordination and market negotiations.
 - The espousal of e-procurement is an ongoing project and more and more companies are willing to join into this process. The study was conducted only with some of the pharmaceutical companies in India. Hence it would be interesting to investigate the outcomes and challenges against with larger sample.
 - The study could also be conducted as a longitudinal study assessing the development over time.
 - This study undertook with selected pharmaceutical companies in South India. It can be further expanded to study international markets with different cultures and growth rates in pharmaceutical sectors.
 - The study can be conducted to see the similarities and differences in the process of procurement of multiple nations.
 - Since this study was conducted only with pharmaceutical companies, a further study can be carried out with other manufacturing industries.
 - The integrated final framework made from the study is to ensure the users' expectations and maximum positive outcomes of parameters. Hence care must be taken during the development of such a framework by ensuring the right processes and to protect organizations from financial losses, if arise.
- 4. Conclusion:** One of the most significant recent technology developments in the area of purchase is e-procurement. MNCs favor establishing and growing their businesses in India due to the country's faster economic growth and attractive business climate of the pharmaceutical industry. The GDP contribution of the pharmaceutical manufacturing sector in India is relatively substantial. In these circumstances e-procurement procedures must be adopted in order to increase their purchasing capacity. There were very few research studies published in other nations, but not many have focused on the e-procurement practices used in Indian pharmaceutical companies.

The study was carried out effectively with the help of extensive literature reviews, case studies and experience surveys. It can be observed from the literature review that there are various frameworks that addressed the importance of espousal and assessment of e-procurement. However, in the studies that exclusively concentrate on the pharmaceutical manufacturing business, no such frameworks have been developed.

In the present technology scenario, the manufacturing industries are looking for well-developed industry-specific models for planning and measurement of e-procurement. This arousal of interest prompts the identification of crucial criteria for the espousal and assessment of e-procurement in pharmaceutical manufacturing companies. Therefore, this research attempts to develop an integrated framework for espousal and assessment of e-procurement in particular with pharmaceutical companies. The developed integrated framework helps the procurement team to understand all the stages of espousal.

Based on the suggestions provided by the experts and available frameworks in literature reviews, the final framework is developed by covering all the activities of procurement and parameters to fulfil the future implementation of e-procurement in pharmaceutical companies. It also demonstrates the potential of e-procurement espousal for the pharmaceutical industry to conceptualize and redesign their procurement processes.

The assessment framework can be used by industries to measure the success of the e-procurement system. It also helps users to figure out areas of improvement in the system. This improves the system more effective, efficient, productive and more profitable.

5. Limitations: Researcher has some limitations and boundaries in order to find out the feasibility of the study.

- This study was conducted only with the selected pharmaceutical companies in South India based on the willingness of providing information on the espousal and assessment of e-procurement.
- The majority of the pharmaceutical manufacturing companies located in Telangana and Andhra Pradesh are registered in Telangana state. Since this study was conducted with the procurement people working in corporate offices, the researcher considered those companies which are situated in Telangana State for analysis.
- Confidentiality is a major limitation in gathering information relating to e-procurement parameters both in espousal and assessment of e-procurement. The respondents were informed in advance by the researcher for the purpose of the research was meant exclusively for academic purpose and not for other investigations.
- A complete validation of the proposed framework depends on implementation. A quantitative calculation has been a limitation of this study since it is not implemented yet.

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