A Study On The Vendor's Opinion On The Effectiveness Of Input Procurement System At Vizag Steel Plant

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Abstract

The procurement process plays a significant role and improvements can be made for increasing the productivity of the materials team thereby resulting in improvement in production. Being a public sector, following procurement guidelines viz: tendering, evaluation, conducting auctions amongst technically & commercially qualified bidders and meeting the plant requirements on scheduled time is a challenging task for the company. The present study analyses the dimensions of the effectiveness of the input procurement system and also examines general information about the suppliers.The study stated that the identified five dimensions of the input procurement system havea positive opinion by the respondents.The results indicate that the dimensions transparency, adaptability, ease of and grievance redressal are significantly associated while the timely payment is not significantly associated with the input procurement system.

Keywords: Adaptability, Effectiveness, Grievance, Procurement, System, Transparency

Introduction

The world's vital engineering and construction material is steel. Global crude steel production has more than tripled in the last 50 years. Developed nations like the U.S.A. and Russia reduced their domestic production. In global crude steel production, China's share is more than 50 percent. The rapid increase in production has resulted in India becoming the world's second-largest crude steel producer. India is a fast-growing economy, The GDP growth forecast for current the financial is around 6.5 percent and becomes the 5th largest economy in the world overtaking the United Kingdom (UK).

Rashtriya Ispat Nigam Limited(RINL)/VSP is a giant Steel Manufacturing PSE under the Ministry of Steel, GoI set up to produce 7.5 million tonnes of liquid Steel, a Navratna company's first shore-based integrated steel plant at Visakhapatnam, Andhra Pradesh. RINL/VSP is on the growth path and has increased its capacity by almost double to a level of 7.3 Mtonnes of liquid steel progressively. RINL/VSP set up a Forged Wheel Plant (FWP) at Lalgunj, UP. In India. The MM is a core function of supply chain management, involving the planning and execution of supply chains to meet the material requirements of an organisation. The main role of MM is to meet the satisfaction of indenters consistently, to gain economy in purchasing to contain costs, to carry reserve stock to avoid stock out and Instilling efficiency in all activities. Modern managements look at purchasing as a "Profit Centre". Money saved in procuring material will directly reflect on the profitability of the organization.

The main areas of procurement are processing purchase requisitions, tendering process, processing repeat/confirmatory orders, processing rate contracts, managing emergency purchase/job contracts, and placement of purchase orders/work orders. The procurement cycle is the time taken to complete the purchase cycle is called lead time. The GoI, the Department of Commerce and Industries and the Ministry of Commerce introduced the Government E-Marketplace 'GeM' to facilitate online procurement to central and state government departments and PSUs. The GeM is strongly tied to the "Make in India" initiative, and also embedded into the "Digital India" initiative. In the total annual procurement value of RINL, more than 60 percent was procured through GeM.

The procurement process plays a significant role and improvements can be made for increasing the productivity of the materials team thereby resulting in improvement in production. Being a public sector, following procurement guidelines viz., tendering, evaluation, conducting auctions amongst technically & commercially qualified bidders and meeting the plant requirements on scheduled time is a challenging task for the company.

In this context, the proposed study identifies the building blocks of the procurement processin the materials management department, and the strategy to develop efficient procurement capabilities to meet the requirements of production and compete with competitors. The study also aims to develop a structural model based on supporting theory to develop a comprehensive Input procurement system and its impact on the performance of the Visakhapatnam steel plant.

Review of Literature

The study analysed the concerned literature related to the effectiveness of material management among companies. Adinyira et al. (2021)assessed the effectiveness of multilateral aid agencies' auditing tools in procurement risk mitigation on funded projects in a developing country context. The results of the analysis showed a clear decline in the number of both major and minor deviations over the three years while an increase in the number of contracts with "No Deviation". The study, therefore, concludes that procurement risk experienced a decline amongst the World Bank projects in Ghana where post reviews were carried out on yearly basis.Betty, et al. (2021)examined the role performed by public sector organisations (PSO) in public-private partnership (PPP) infrastructure procurement intending to delineate PSOs obligations and consequently improve project success. The study found that roles inthe management of variation, apportionment of penalties and abatements, selecting preferred bidders, and establishing management approaches for PPP risks are not frequently performed by PSOs in Nigeria.

Nilesh and Laishram(2017)studied sustainable infrastructure development challenges through the public-private partnership (PPP) procurement process and infrastructure development. The study reveals the shortcomings in the Indian PPP procurement process using the key principles of sustainability. The key shortfalls identified from the study that adversely affect progress toward sustainable development include, incomprehensive environmental impact assessment and social impact assessment studies; lack of stakeholder and local participation; high bidding and transaction cost; high user charges; improper risk allocation; lack of transparency and accountability; goal conflicts between public and private sector; and lack of skill and knowledge about sustainability.Rath and Mohan(2021) studied the impact of COVID on RINL, and handling of such future eventualities was addressed and discussed in detail the various strategies adopted by the industry during the period. After the outbreak, the recovery and outlook of the Steel industry were explained in detail. Interventions and initiatives sought from the Government were also presented. The paper mainly covers the impact of COVID on Materials Management as the raw Materials (Upstream side) prices soared and affected the steel production of the Company. Lockdowns spreading all over the world, which indirectly affected the import of metallurgical coal and transportation from ports, resulted in a decrease in raw material stocks in many steel plants, especially RINL.

Vikram Kulkarniet al. (2017)studied the factors affecting effective materials management in building construction projects and filling the voids created by improper material management on construction sites. The researcher opinionated that only large firms use typical protocols and software for material management, hence they faced minimum problems. On the other hand, medium and small firms lack behind in material management as they don't use any software or they aren't aware of material management techniques. Lack of material management ultimately results in delays in work, project cost overruns, decrease in labour productivity and wastage of materials. Ramkumar(2016)studied the increasing complexity and dynamism of new technology implemented in the risk assessment process and the methodology for e-procurement implementation based on a modified analytic network process (ANP). The proposed methodology incorporates knowledge and judgements obtained from experts to carry out the identification of risk factors

and to assess the risk magnitude of the identified risk factors based on factor index, risk likelihood and risk severity. The results indicate that by using the proposed methodology, the technological risk assessment of new technology can be done effectively and efficiently.

Abimbola, etal.(2020)investigated the impacts of procurement strategies on the growing proportion of construction of small- and medium-sized enterprises (SMEs) and whether the size of the construction company moderates the effect. The research indicates that only traditional and management-oriented procurement strategies ensure the achievement of all growth plans for construction SMEs in South Africa; and that medium-sized construction enterprises achieve social growth such as community empowerment, managerial skills and advancement on the Register of Contractors. The investigation shows the moderating effect of SMEs' diversity on their growth proportion as influenced by procurement strategies.

Research Objectives and Hypotheses

The specific objective of the study is to identify and analyse the dimensions of the effectiveness of the procurement system. Also, analyse the general information of the suppliers.

Based on the literature the following hypotheses are developed:

There is a significant association between the type of organisation, sector of procurement experience, age of the organisation, number of branch offices, and range of annual turnover and the determinants of procurement system *viz.*, Transparency (H1), Adaptability (H2), Ease of use (H3), Timely payment (H4), and Grievance redressal (H5).

Research Methodology

The study collected primary data from the Vendors/suppliers of VIZAG Steel Plant using a self-administered questionnaire. However, the study also conducts Focused Group Discussions and Interviews with target respondents to get more qualitative insights. The self-administered questionnaire is designed carefully based on the attributes identified. The validity and reliability of the survey instrument are tested carefully. The pilot study is conducted before collecting the full-scale data from the target respondents. The secondary data is collected from the records of VSP and annual reports of companies, the Ministry of Steel, reports of trade associations, websites, etc.

The study collected data from primary sources through a representative sample. The total number of vendors of VSP is 3000. A sample of 15 per cent is taken for the study which comes to 450. A simple random sampling technique will be used to select the sample unit. The vendors are contacted online and the information will be elicited through a well-structured questionnaire. The responses are validated with the use of statistical techniques. The sample is determined based on Krejcie and Morgan, (1970) formula. To analyze and interpret the perceptions of the sample respondents, the data were inserted into the database. The tabulations and the results for analysis were done using SPSS (Statistical Package for Social Sciences) version 22 and Microsoft Excel 2016 for statistical measurements such as percentages, mean values, factor analysis, regression analysis etc., for category-wise analysis was administered. ANOVA test is conducted for more than two categories of variables. For simple percentages and percentage scores, the researcher has drawn diagrams to get clear representations.

General Information of the Suppliers

The general information related to the supplier *viz.,* type of organisation, sector of procurement experience, age of the organisation, number of branch officers, and range of annual turnover is shown in Table 1.

Table 1. General Information of the Suppliers

Parameters		Frequency	Percent
Type of Organisation	Local	335	74.4
	Non-Local	115	25.6
	Total	*450*	*100*
The sector of Procurement experience	Micro	98	21.8
	Small	103	22.9
	Medium	131	29.1
	Large	118	26.2
	Total	*450*	*100*
Age of Organisation	Below 10 years	47	10.4
	11 - 20 years	141	31.3
	21 - 30 years	103	22.9
	31 - 40 years	58	12.9
	41 - 50 years	38	8.4
	Above 50 years	63	14
	Total	*450*	*100*
Number of branch Offices	None	93	20.7
	Less than 5	272	60.4
	5 - 10	29	6.4
	11 - 15	29	6.4
	16 - 20	4	0.9
	More than 20	23	5.1
	Total	*450*	*100*
Range of annual turnover	Below 25 crores	155	34.4
	26 - 50 crores	61	13.6
	51 - 75 crores	31	6.9
	76 - 100 crores	27	6.0
	Above 100 crores	176	39.1
	Total	*450*	*100*

The type of organisation operated by the respondents reveals that 74.4 per cent are operators of local organisations whereas, 25.6 per cent are non-local organisational operators. The sector of procurement experience of the respondents reveals that 29.1 per cent are medium enterprises. There are 26.2 per cent of the respondents operating in the large sector, 22.9 per cent of the respondents related to small enterprises and 21.8 per cent of the respondents in micro-level enterprises. The age of the organisations operated by the respondents reveals that out of the total, 31.3 per cent are operating between 11–20 years. There are 22.9 per cent of the organisations operating for 21–30 years. The organisations representing 14 per cent are operating for above 50 years, 12.9 per cent are operating for 31–40 years, 10.4 per cent of the organisations are operating below 10 years, and 8.4 per cent of the organisations are operating between 41–50 years.

The number of branch offices maintained by the suppliers states that 60.4 per cent have less than 5 branch offices. There are 6.4 per cent of the respondents have 5–10 branch offices, 6.3 per cent of the respondents operate 11–15 branch offices, 5.1 per cent of the respondents maintained more than 20 branch offices, and only one per cent of the respondents have 16–20 branch offices. However, 20.7 per cent of the respondents do not operate any branch offices. The range of annual turnover generated by the respondents reveals that out of the total, 39.1 per cent of the organisation's annual turnover is above 100 crores. It is

found that 34.4 per cent of the organisations earn an annual turnover of below 25 crores. The organisations representing 13.6 per cent are generating an annual turnover of 26-50 crores, 6.9 per cent of the organisations are earning 51-75 crores and 6 per cent of the organisation's annual turnover is in the range of 76-100 crores.

Opinion on Determinants of Effectiveness of Procurement System

The descriptive statistical analysis related to the respondent's opinion on the referred five determinants of the procurement system *viz.,* transparency, adaptability, ease of use, timely payment and grievance redressal is presented in Table 2. Among the five determinants, transparency is the highly-rated variable with a mean value of 4.29 followed by the determinants adaptability (4.15), timely payment (4.11), grievance redressal (4.05), and ease of use (3.94).

Table 2. Determinants of Effectiveness of Procurement System

Sl.No.	Parameters	Mean
Transparency		**4.29**
1	Security and privacy of information are highly protected	4.51
2	Packing and Delivery terms are clear and reasonable	4.26
3	Specification parameters are defined without ambiguity	4.21
4	In the e-reverse auction, auto start bid price is more transparent	4.16
Adaptability		**4.15**
1	Necessary infrastructure with hardware and software support is available	4.21
2	Guidelines issued by various authorities are compiled and made available	4.16
3	The skills and capabilities of a purchase manager are adequate	4.14
4	Suitable training has been imparted for participating in the e-procurement system	4.08
Ease of Use		**3.94**
1	Frequent interaction between buyers and vendors is desirable to avoid unwarranted disputes	4.19
2	Consolidated procurement data shall be necessary for trends	3.89
3	The procurement system manual shall be much simpler and more understandable	3.83
4	The availability of a broad list of items for external procurement is necessary	3.83
Timely Payment		**4.11**
1	Payment through banking channels is a very good tool	4.27
2	It is necessary to release the payment with interest for delayed payments	4.25
3	Payments within time schedules shall be made for the sustaining of the MSEs	4.12
4	Integrated Financial Management Information System is contributing to effective timely payment to the vendors	3.80
Grievance Redressal		**4.05**
1	Periodic review with the suppliers will help in taking corrective steps	4.28
2	Answer the queries from bidders within stipulated timelines	4.18
3	Delay in resolving the queries is detrimental to the subsequent supplies	4.02
4	The procurement decisions on trial consignments shall be brought into the ambit of the financial audit	3.73

In the case of transparency, the highly rated determinant is 'security and privacy of information are highly protected' with a mean value of 4.51 followed by the determinants 'packing and delivery terms are clear and reasonable (4.26)', 'specification parameters are defined without ambiguity (4.21)', and 'in the e-reverse auction, auto start bid price is more transparent (4.16)'. Referring to the determinant adaptability,

'necessary infrastructure with hardware and software support is available' is the highly-rated variable with a mean value of 4.21, followed by the variables 'guidelines issued by various authorities are compiled and made available (4.16)', 'the skills and capabilities of a purchase manager are adequate (4.14)', 'suitable training has been imparted for participating in the e-procurement system (4.08)'.

In the case of ease of use, the highly rated variable is 'frequent interaction between buyers and vendors is desirable to avoid unwarranted disputes' with a mean value of 4.19 followed by the variables 'consolidated procurement data shall be is necessary on trends (3.89)', 'procurement system manual shall be a much simpler and more understandable (3.83)', and 'availability of a broad list of items for external procurement is necessary (3.83)'. Regarding timely payment, 'payment through banking channels is a very good tool' is a highly rated variable with a mean value of 4.27 followed by the variables 'it is necessary to release the payment with interest for delayed payments (4.25)', 'payments within time schedules shall be made for the sustaining of the MSEs (4.12)', and 'integrated financial management information system is contributing to effective timely payment to the vendors (3.80)'. Regarding the grievance redressal dimension, the highly rated variable is 'periodic review with the suppliers will help in taking corrective steps' with a mean value of 4.28 followed by the variables 'answer the queries from bidders within stipulated timelines (4.18)', 'delay in resolving the queries is detrimental to the subsequent supplies (4.02)', and the procurement decisions on trial consignments shall be brought into the ambit of the financial audit (3.73)'. Thus, it can be inferred that the stated five dimensions has significant positive opinion by the respondents in the input procurement system.

Table 3. ANOVA

Constructs		Sum of Squares	df	Mean Square	F	Sig.[b]
Transparency	Between Groups	3.776	1	3.776	11.084	0.001
	Within Groups	152.634	448	0.341		
	Total	156.410	449			
Adaptability	Between Groups	0.861	1	0.861	3.572	0.009
	Within Groups	107.921	448	0.241		
	Total	108.781	449			
Ease of Use	Between Groups	0.847	1	0.847	3.096	0.017
	Within Groups	122.602	448	0.274		
	Total	123.449	449			
Timely Payment	Between Groups	0.083	1	0.083	0.269	0.604
	Within Groups	137.898	448	0.308		
	Total	137.981	449			
Grievance Redressal	Between Groups	0.183	1	0.183	0.668	0.014
	Within Groups	122.463	448	0.273		
	Total	122.646	449			

b. Predictors: (Constant), Range of annual turnover, Type of Organisation, Number of branch Offices, Age of Organisation, Sector of Procurement

The results of the ANOVA test related to the respondent's opinion on determinants for the effectiveness of the procurement system are shown in Table 3. The results indicate that the dependent variables transparency (F=11.084, p=0.001 < 0.05), adaptability (F=3.572, p=0.009 < 0.05), ease of use (F=3.096, p=0.017 < 0.05) and grievance redressal (F=0.668, p=0.014 < 0.05) shows a significant association with the independent variables range of annual turnover, type of organisation, number of branch offices, age of the organisation, and sector of procurement experience. However, the dimension of timely payment (F=0.269, p=0.604 > 0.05) does not show a significant association with the independent variables range of annual turnover, type of organisation, number of branch offices, age of the organisation, and sector of procurement experience.

Thus, the regression analysis results provide strong support for the acceptance of the hypothesis relating to the association between independent type of organisation, age of the organisation, and sector of procurement experience with the dependent variables transparency (H1), adaptability (H2), ease of use (H3) and grievance redressal (H5), and rejection of hypothesis relating to the association between independent type of organisation, age of the organisation, and sector of procurement experience with the dependent variable timely payment (H4).

Conclusion

The study specifically identified the dimensions of the effectiveness of the input procurement system. The study found that the input procurement system dimensions transparency, adaptability, ease of use and grievance redressal have a significant association with the supplier's demographics viz., range of annual turnover, type of organisation, number of branch offices, age of the organisation, and sector of procurement experience. However, the timely payment dimensiondoes not have a significant association with the supplier's demographics. Accordingly based on the findings certain recommendations are made for increasing the effectiveness of the input procurement system in the steel sector.

The suppliers/Vendors can be provided with easy access to participate in the e-tendering process without much difficulty in the input procurement system. More effective policies and procedures can be adopted on non-responding/non-serious vendors with further action to see that they are participating in future tenders.Necessary policies and procedures need to be framed in purchase sections of materials management regarding budgetary quotations whenever the registered vendors are not participating in the input procurement bidding process.The supplier should be provided with an effective IFMIS, To enable it to get the present status of payment and bill information.The material management should focus on resolving the pending queries/grievances of suppliers so that the vendor is not dissatisfied and would participate in future tenders regularly.

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