

Abstract

The *lean* methodology allows organizations to identify and eliminate waste activities or steps without value within a process or processes. The project follows the Define, Measure, Analysis, Implementation, and Control (DMAIC) model to eliminate and mitigate waste impact to the effectiveness of Cotecmar's procurement process.



DEFINE

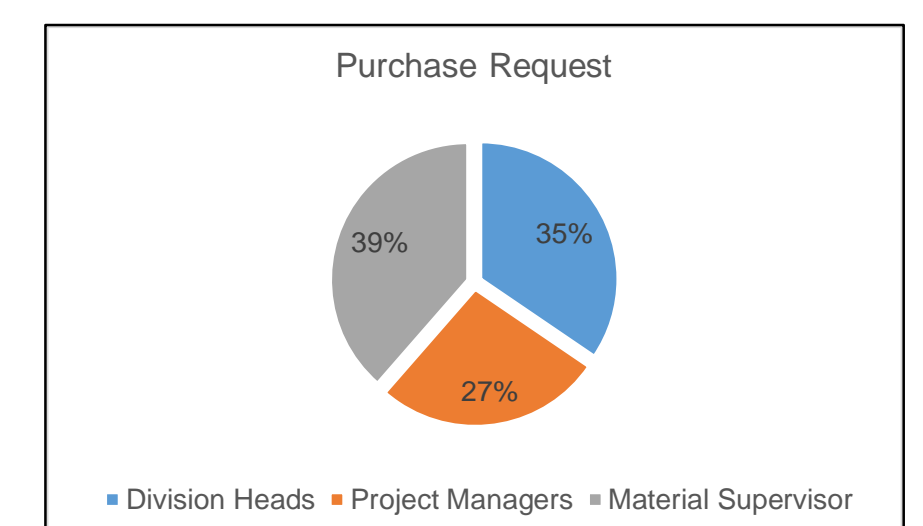
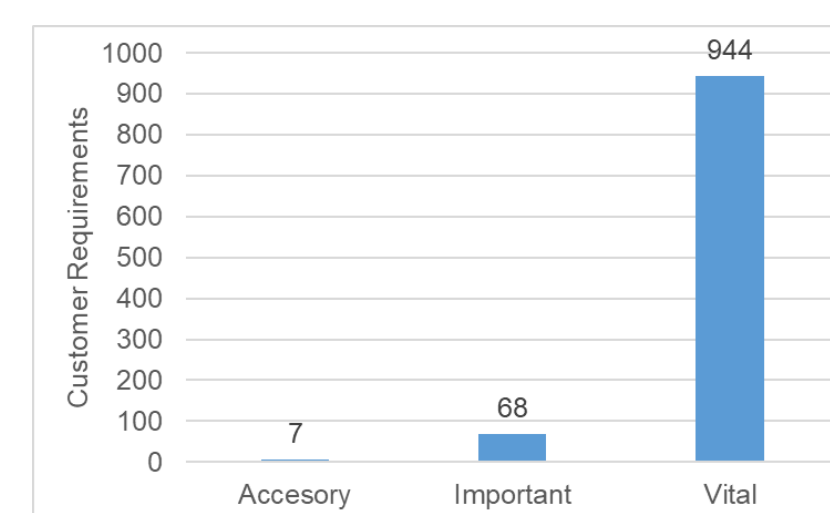
The Define stage applies *lean* tools such as the Swim Lane Flowchart and the Supplier, Input, Process, Output, Customer (SIPOC) to breaks down the details for each step of the process.

Supplier	Input	Process	Output	Customer
Customer	Requirement	Verification	Quote Requirement	Estimation Department
Sales Office	Quote Requirement	Cost identification	Quote to be signed	Sales Office
Estimation Department	Quote to be signed	Signature and customer approbation	Sales project	Project Management Department
Sales Office	Sales project	Needs identification and prioritization	1. Internal Services: Job requirement 2. External Services: Services PR 3. Goods: PR elaboration requirement	1. Division Head 2. Acquisition Analyst 3. Material Supervisor
Project Manager	Job requirement	Identification of needs to purchase	PR	Acquisition Analyst
Project Manager	PR elaboration requirement	Code assignation PR elaboration VMI verification	PR	Acquisition Analyst
1. Division Head 2. Project Manager 3. Material Supervisor	PR	Supply strategy identification Quote request Supplier selection PO elaboration and submit	PO	Supplier



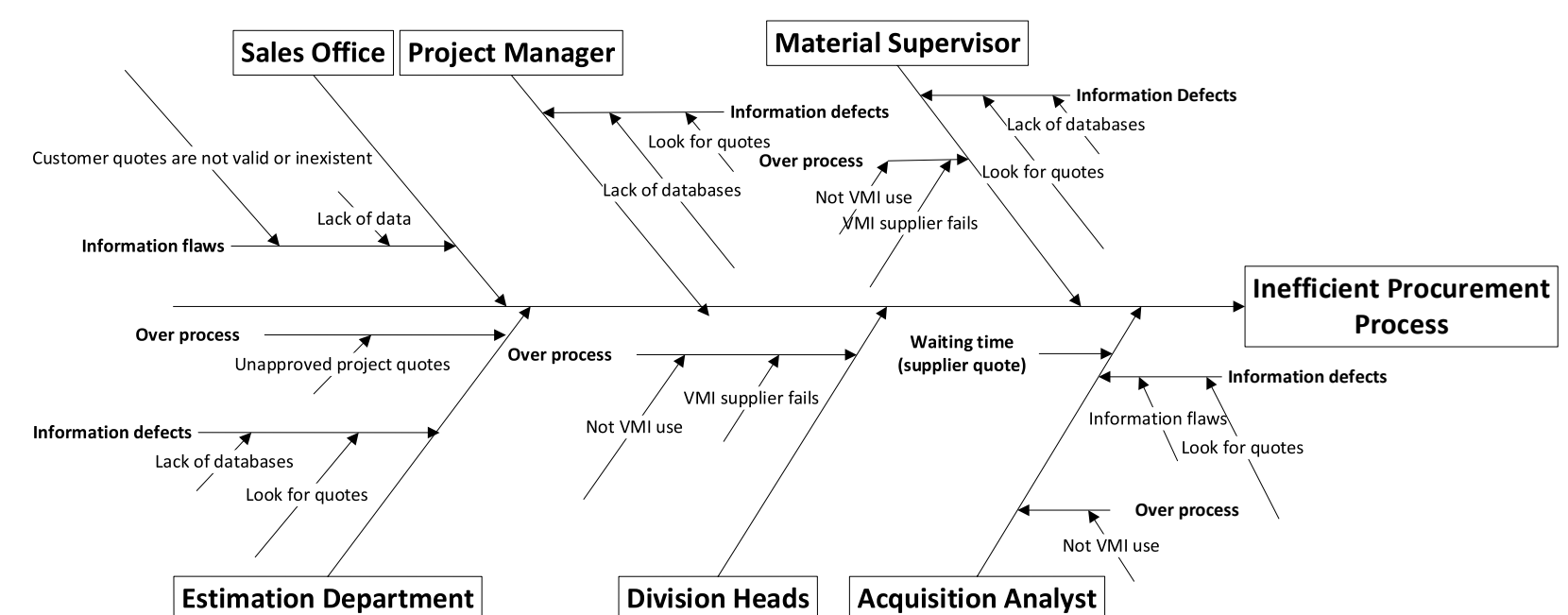
MEASURE

The Measure stage presents information from two main sources, the estimation report, and the ERP reports.



ANALYZE

The Analyze stage presents a cause-and-effect diagram to identify the main causes for inefficiency. Additional analysis include the waste classification.



IMPROVE

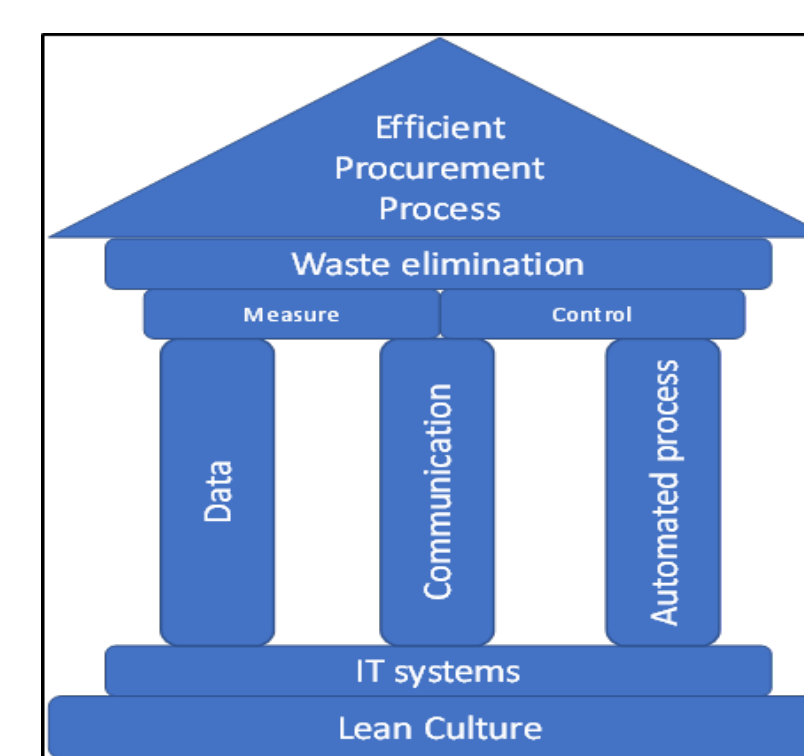
Cost	Impact	Low	High
		<ul style="list-style-type: none"> Prioritization update Increase division heads' participation in VMI agreements 	<ul style="list-style-type: none"> Provide customer with the supplier's database Periodic data revisions Adopt a quotes database
High		<ul style="list-style-type: none"> Include estimation activities into ERP Implement Lean strategy 	

The Improve stage includes the recommendations to Cotecmar to eliminate waste on their procurement process.



CONTROL

The Control stage presents the Lean strategies to maintain the *lean* changes implemented and recommendations for future improvements.



Recommendations

- In the supply chain environment, further improvement and research might focus on achieving a fully automated acquisition plan.
- The presented Lean strategy might extend to the Mamonal complex and eventually, to the shipbuilding complex. Furthermore, by including the information from the ships built by Cotecmar, the repair and maintenance process will reduce the procurement process lead time.