OPTIMIZATION OF PROCUREMENT CYCLE

Project report

Submitted by

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INTRODUCTION

ABOUT THE INDUSTRY

With the strength of over 1.39 million active personnel, it is world's 2nd largest military force and has the world's largest volunteer army. The total budget sanctioned for the Indian military for the fiscal year 2018 is $62.8 billion.

MILITARY BUDGET

The military budget of India is about 1.49% for the year 2018-19 of the total GDP. The defense expenditure for the Fiscal year 2017-18 allotted by Ministry of Finance is, excluding pensions a sum of 2,96,000 crores but including 86,488 crores for Defence capital

STATE ORDERS

India has been spending worth nearly $3.5 billion to boost its aging Soviet-era military equipment. It has been pushing for greater indigenization of the military industry as India imports around 70 percent of its defense hardware mainly from Russia, Japan, Israel and the United States.

Although India's track record as an arms exporter bears witness of its limited success recent defense export contract are noteworthy. In March 2011 New Delhi agreed to sell its first indigenously designed and built multi-role offshore patrol vessel (OPV) named Barracuda, to Mauritius. In March 2017, India finalized a deal with Myanmar for sale of indigenously developed lightweight torpedoes worth USD 37.9 million. Similar naval plate forms were sold to Sri Lanka and Vietnam as well

In Sep 2017 Ordnance Factories Board secured its biggest export order from UAE for the supply of 40,000 pieces of a component used in Bofors artillery guns for Rs 322 crore.

ORGANISATIONS

The production of Indian defense equipment prior to 2011 was completely in the hands of the Government of India. The Government of India also opened up the foreign direct investment to 49% from the existing 26% and thereby increasing the flow of funds from foreign countries. With the increase in FDI cap, private players such as companies from many developed countries will also be attracted to the Indian defense economy as they can have shared in the Indian defense Companies.

Indian industry today is on the threshold of entering into a new era where it will assume greater responsibility in making the nation self-reliant in Defence Production. The resurgence of India's manufacturing sector has been remarkable. Not only are the profits soaring, the sector is also making its presence felt abroad as many Indian firms are becoming transnational companies. The Indian manufacturing sector is internationally competitive with international quality standards, efficiency, and manufacturing facilities. India is fast developing into a manufacturing hub for world corporations wanting to leverage the sector's proven skills in product design, reconfiguration and customization with creativity, assured quality and value addition.

India, also keen to strengthen its own aerospace industry and has asked major weapon exporting countries to

Transfer technology to India. The Indian Aerospace Industry is witnessing an unprecedented growth. Hindustan Aeronautics Limited (HAL), which is fully owned by the Government of India, is the premier aerospace company in the country. HAL has played a major role in the Defence aviation of India through design, manufacture, and overhaul of fighters, trainers, helicopters, transport aircraft, engines, avionics and system equipment. HAL is now ranked 34th in the list of world's top 100 defense companies HAL is a major partner for the Space programmes of Indian Space Research Organization (ISRO) and manufactures structures and assemblies for the launch vehicles and satellites at its dedicated Aerospace Division in Bangalore. The civil aviation sector in India is growing rapidly. It has recorded annual growth of over 41% in passenger traffic during in the last two years. In fact, it has contributed significantly to the growth of international civil aviation sector. The rapid growth of civil aviation has put extreme pressure on the existing civil aviation infrastructure. As a result, the thrust is now on the modernization of airports, communications, navigation and surveillance systems for air traffic management, radars, and facilities for Maintenance Repair and Overhaul of aircraft and subsystems. There is thus enormous potential and huge opportunities for collaboration and creation of joint ventures in the aerospace sector in India for establishing Maintenance Repair Overhaul (MRO) facilities for civil and military aircraft, overhaul and maintenance of aero engines and production of avionics, components, and accessories both in the civil and military aviation sectors. The major global aviation industry is already eyeing the local market in India and scouting for outsourcing aerospace and defense products as India is fast emerging as a center for engineering and design services.

ABOUT THE COMPANY

Tata Advanced Systems Limited (TASL) is a fully owned subsidiary of Tata Sons, a holding company for the Tata Group. It is the lead systems integration company for delivering weapons from the Tata Group to the Indian security forces. TASL entered into a joint venture with Sikorsky Aircraft Corporation to manufacture the Sikorsky S-92 helicopter in India for the domestic civil and military markets. The plan was to have a USD 200 million manufacturing plant operational in Hyderabad by 2010. As production began, the first S-92 cabin was delivered in November 2010, and capacity was expected to increase to 36-48 cabins a year. By the end of July 2013, assembly of 39 cabins had been completed. The joint venture with Sikorsky has since been expanded to include the development of aerospace components for other OEMs. This facility, called Tara, also located in Hyderabad, was completed in 2011 and commenced production in 2012. Another TASL joint-venture, with Lockheed Martin, is producing aerostructures for the Lockheed C-130 Hercules and the Lockheed C-130J Super Hercules in India. It is a 74:26 joint venture which currently assembles Hercules center wing boxes and empennages.

In partnership with Airbus Defence and Space, the company fielded the EADS CASA C-295 for the Indian Air Force light-cargo fleet renewal program, which the Indian government approved on 13 May 2015. Under the project 16 complete aircraft will be imported, while 40 aircraft will be manufactured in India.

The company has also entered an agreement to produce structures for the Pilatus PC-12NG from 2016 to 2026. On 3 May 2018, Tata Advanced Systems acquired Tata Motors' aerospace and defense unit in a sale. Tata Advanced Systems Limited (TASL), a wholly owned subsidiary of Tata Sons, is the Strategic Aerospace and Defence arm of the TATA Group. TASL is both an operating & a holding company. TASL group is fast emerging as a key Defence and Aerospace player in India with established capabilities and demonstrated deliveries in the following areas:

- Radar Systems and sub-systems
- Command & Control Systems
- Aerospace & Aero-Structures
- Unmanned Aerial Systems

RADAR SYSTEMS AND SUBSYSTEMS

Radars are a key thrust area. NOVA, a 100% TASL subsidiary, participating in major radar acquisition programs of Indian Defence Services via a partnership with global OEMs. For all such programs, detailed production and ToT arrangements have been worked out to meet the requirements of Indian MoD. Some of the key programs are Indian Navy’s Surface Surveillance Radar Program. Indian Navy’s 3D C/D Band Radar.
Indian Air Force’s High-Power Radar. NOVA is working on opportunities with global OEMs to be their Indian Offset Partner for Radar programs. Subsidiary HELA has a Microwave Electronics facility in Hyderabad catering to design, development and manufacture of microwave super components, sub-systems and Automatic Test Equipment (ATEs).

COMMAND & CONTROL SYSTEMS

TASL & its subsidiary NOVA are involved in design & manufacture of Mission Control Centers (MCC) & Combat Management Systems (CMS). These Mobile MCC & CMS units are designed to ensure deployment in any physical geography and operate under extreme weather conditions. In addition, these shelters and trailer based units are designed to survive HEMP & BC Events. The MCC units are equipped with multi-layer Satellite Communication backed by rugged leased line connectivity using national information backbone. The satellite Communication network of the MCC can be designed to operate in HUB / MESH architecture delivering Point to Point or All-Aware network model. Additional communication equipment like Line of Sight Radio Links can also be used based on mission requirements. The mission centers are customizable based on user requirements. They can be configured with Enterprise Grade equipment for intensive computing application or provided with compact & rugged units for switching, routing, VoIP and network management. TASL is also focusing on developing complementary products that are an integral part of Command Control Systems. Some= such products that TASL has developed are Rugged switches, Radio Interoperability Gateways with VoIP, Precision Timing Protocols, Network Management Systems and RF Planning & Deployment Tools. These enable seamless connectivity and quick deployment of Mission Control Centres and Missile launchers in Tactical Battle Area.

AEROSPACE & AERO-STRUCTURES

TASL has been established as the lead entity for the Tata Group to address the large aerospace and aerostructure opportunities for India as well as for the rest of the world. With 3 operational programs, proven deliveries, and more than 1400 highly trained resources, TASL is on its way towards becoming the global supplier of choice of global aerospace OEMs. The backbone of TASL's vision is its capability across the value chain - design, engineering, detailed part manufacturing and major structural assembly. The programs are nurtured with the highest level of customer focus and safety, delivered through robust quality systems, procedures, and practices certified to AS 9100, NADCAP standards. Following are the key Programs under execution where TASL has become a global single source supplier to the OEMs: Sikorsky S 92 Helicopter Cabin Assembly including Wire Harness Installation Lockheed Martin C 130 J Empennage & Centre Wing Box Assembly Detailed Part Manufacturing (Tata Sikorsky JV) with capabilities in Machining, Sheet metal forming, tube bending, special processes, and quality assurance.

UNMANNED AERIAL SYSTEMS

Unmanned Aerial Systems are a key ingredient of C4I systems offering the security forces with real-time ISR capabilities. In-house design and development of Mini & Micro UAV systems, complemented by the indigenous design of major subsystems like Autopilot, Ground Control Station, Gimbal based payloads etc. has enabled TASL to offer cutting-edge solutions for the current and future UAV requirements of the Indian Security Forces.

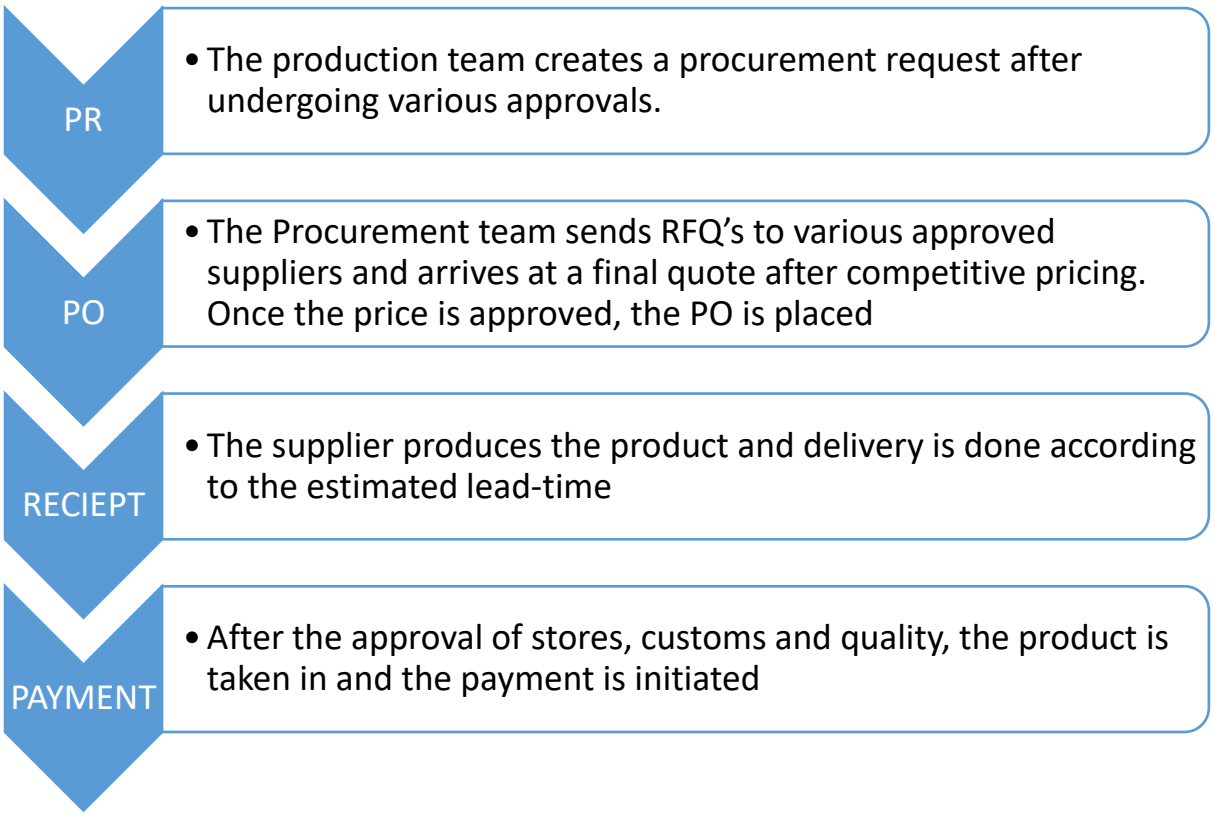
OBJECTIVE
AND
SCOPE OF STUDY

CURRENT SCENARIO

TASL being a leader in Indian aerospace and defense industry, the load of procurement and sourcing is immense. Since the throughput is lesser in numbers, more emphasis is given to the quality of the material delivered. This required a huge emphasis on selecting the proper suppliers with high quality. At the same time, due to this, the lead time of most of the materials are too high. This is because the materials are not standard materials and doesn't have a lot of suppliers around the world. Due to this, the materials of superior quality are sourced from overseas and the suppliers don't hold stock of these materials, rather follow 'make-to-order' process. These are the main reasons that contribute to the high lead times of materials.

With that said, these are the external factors that increase the lead time of the process. Similarly, there are many internal factors that increase the lead time of the process.

For a department to procure a material, 4 stages are involved



PRIMARY OBJECTIVE

- To reduce the internal lead time of procuring materials for production
- To provide transparency and visibility among the stakeholders so that everyone can know the status of each process
- Establishing pro-activeness by being prepared for an upcoming process
- Improve Buyer-Supplier relationship
- Improve the efficiency of operation in the firm
- To reduce paperwork – GO GREEN

Business Impact

To provide visibility among the stake holders in the entre process. And since this reduces the Manufacturing Lead time, TASL will be able to increase its yearly throughput drastically, hence increasing the revenue per year

SCOPE OF STUDY

The project aims at centralizing the process of materials procurement for production. This project when implemented, brings all the teams creating PR, interacting with the supplier and placing PO for the required material, in-warding the material into the company and paying the supplier, all under one roof through a centralized portal.

The objectives of the Optimization of Procurement Cycle are as follows:

- To reduce the internal lead time of procuring materials for production
- To provide transparency and visibility among the stakeholders so that everyone can know the status of each process
- Establishing pro-activeness by being prepared for an upcoming process
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Types of research and research design:

- **Quantitative Research** – Quantitative research generates numerical data or information that can be converted into numbers. Only measurable data are being gathered and analyzed in this type of research

- **Qualitative Research** – Quantitative research, on the other hand, generates non-numerical data. It focuses on the gathering of mainly verbal data rather than measurements. The gathered information is then analyzed in an interpretative manner, subjective, impressionistic or even diagnostic.

Assumptions and Constraints

Assumptions

This section identifies the statements believed to be true and from which a conclusion was drawn to define this project charter.

1. Assumptions are made from the answers obtained after interviewing various personnel various departments
2. Assumptions are made from historical procurement data

Constraints

This section identifies any limitation that must be taken into consideration prior to the initiation of the project.

- Since the data is obtained form different individual in each department, the opinions may vary, which may affect the accuracy of the data
- The data obtained is historical, therefore there may be variance from the forecast and actual implementation

RESEARCH METHODOLOGY

- A Questionnaire was prepared to collect input from all the internal stakeholders of the company
- The survey has been done out of the company covering a wide cross-section of the industry
- The question was presented in one to one interview with each of the respondents
- Responses of the concerned persons had been thoroughly analyzed
- The conclusion has been arrived at using the responses of the concerned persons and not from the questionnaire alone

The company starts its production from early in the morning and functions very busily till 5 p.m. in the evening. The working environment resembles a beehive working together to achieve something great with the bigger picture in everyone's vision. In such a scenario, sitting with each stakeholder for a one on one interview was a hectic and time-consuming task to carry out.

A prior communication had to be made with these individuals and an appointment had to fix with these individuals to have a sitting with them and take in their valuable input on how this company works and to shed light on the practical difficulties at each stage of the procurement cycle. But once an appointment was accepted upon, the stakeholders tried to provide their full attention for the cause. They tried to give input to the complete scope of the questionnaire and sometimes even beyond the scope. This interacting with stakeholders from various sectors of the company allowed me to see the bigger picture and look at the process taking place in the industry in a wider perspective.

Inputs received from these stakeholders were later consolidated, analyzed and insights were taken down. This was done for each and every stakeholder who were interviewed. At times, more than one people from a single department were interviewed to have a clear picture of the process that's prevalent. Later, these points noted down from analyzing were used to jot down the proposal and recommendation for the optimization of the entire process.

RESEARCH DESIGN

Research design specifies the methods and procedures for considering a study. A research design is the arrangement of conditions for collection and analysis of the data in a manner that aims to combine relevance in the search purpose with economy in procedure. Research design is broadly classified into three types.

- Exploratory Research Design
- Descriptive Research Design
- Casual Research Design

DESCRIPTIVE RESEARCH DESIGN

Descriptive research studies which are concerned with described the characteristics of the individual. In descriptive as well as in diagnostic studies, the researcher must be able to define clearly, what he wants to measure and must find adequate methods for measuring it along with a clear-cut definition of the population he wants to study. Since the aim is to obtain complete and accurate information in the said studies, the procedure to be used must be carefully planned. The research design must make enough provision for protection against bias and must maximize reliability, with the concern for the economical completion of the research study.

VALUE STREAM MAPPING

Value stream mapping is a flowchart method to illustrate, analyze and improve the steps required to deliver a product or service. A key part of the lean methodology, VSM reviews the flow of process steps and information from origin to delivery to the customer. As with other types of flowcharts, it uses a system of symbols to depict various work activities and information flows. VSM is especially useful to find and eliminate waste. Items are mapped as adding value or not adding value from the customer's standpoint, with the purpose of rooting out items that don't add value.

It's important to keep in mind that customers, whether external or internal, care about the value of the product or service to them, not the efforts it took to produce it, or the value that may flow to other customers. Value stream mapping maintains that focus. A typical process is to draw a current state VSM and then model a better way with a future state and/or ideal state VSM. You can start off sketching by hand and then move to VSM software for better communication, analysis, and collaboration.

Following are the steps to perform value stream mapping:

1. Identify the product or product family to be studied and improved. You typically put together a team to do the mapping and analysis, depending on the size of the initiative. If inexperienced, the team will need training in VSM. Some larger companies may have a value stream manager.

2. Get leadership's buy-in for the value stream mapping project, given the potential costs involved. It's possible you might use a smaller VSM, showing potential improvement, to help gain leadership's buy-in for a fuller look.

3. Determine the problem for the value stream for this product, from the customer's standpoint. You could use A3 analysis of root causes to do this. Make sure the customers' concerns are clearly understood since they are the ones defining value. It's possible that customers might be demanding a price reduction based on competitors, or that quality control problems are reducing value, or that production delays are causing customers to look elsewhere.

4. Bound the process, which means determining the limits or scope of your map. For example, if you're doing lean manufacturing, are you going from raw materials to final product delivered to the customer? Or are you starting with one problematic part of the value stream?

5. Now, do the VSM walk, as outlined in upcoming steps 6-11. Walk (or directly experience) the process steps and information flow required to put out the product or service. Some veteran practitioners do the walk-in reverse, starting with the customer. You might do the walk multiple times to gather more information, filling in any gaps.

6. Define the process steps, keeping within the boundaries you've just defined as you do your walk. In lean manufacturing, all of the steps might take place in a single location that inventory enters and then leaves. You aren't listing out every specific task that could be done by process mapping. You are studying work activities and information flows that produce customer value or don't. It's vital to record the reality of your observations, and not rely on information from employees who may have a vested interest in explaining away a problem. The purpose is to document each significant step required to create the product's value.

7. Collect process data on your walk. This is where you start evaluating the performance of each step of the process. Examples are inventory type and size, cycle time, change-over time, machinery or process uptime and downtime, a number of workers, shifts worked, available working hours and batch size. All of these could result in finding efficiencies and cutting waste. Add that process data to the data boxes of your Value Stream Map.

8. Evaluate the process steps. You also use data boxes for this information. We want to know whether the process step is: a) Valuable, meaning it creates value from the customer's standpoint. You might just ask the customer if he cares whether a step is left out. b) Capable, the degree to which there's a high-quality result every time. c) Available, the degree to which the process step is available when needed. d) Adequate, the degree to which capacity exists to meet customer demands. This often ties in with analysis of constraints, bottlenecks, excess capacity and excess inventory. e) Flexible, the degree to which a process step can switch over quickly and inexpensively from one member of a product family to another. This has been key to Toyota production over the years.

9. Map the movement of the product and information flows. Look for three key things: a) Flow vs. Stagnation. The ideal is for the product to never stop moving. This can be measured by inventory levels. b) Push vs. Pull. This shows how production information is handled. In the ideal value stream, no information is required except for a signal at the top of the stream to make the next product. In reality, however, there are disconnects between parts of the stream. This is dealt with by having the steps able to signal each other as to upcoming needs. c) Level

vs. Erratic. This shows the degree to which the process has been smoothed out for efficiency. This addresses the lean manufacturing concepts of mura(unevenness), muri (overburdening of the value stream to keep up) and Muda (waste.) It's also vital to understand the overall flow of information and communication in the value stream. Producing a product or service of value to the customer means we need to understand the communication touch points. Examples include how customers order the product, how suppliers are contacted, and how we ensure that customers get what they want.

10. Count the inventory. Inventory and overproduction can be an extensive cause of waste. Take special note that inventory may be scattered in a makeshift manner.

11. Create a timeline. Map out process times and lead times for inventory through our process steps. By monitoring inventory levels at each step, we can find inefficiencies and non-value-adding items in our production.

12. Now, reflect on the Value Stream Map to see things that might not have been entirely apparent at first. Use the information you've collected in the data boxes and timeline to find the waste. This could be problems such as excess inventory, too much downtime, long process times or setup times, or quality problems resulting in rework.

13. Then, create a future state Value Stream Map and/or ideal state Value Stream Map. Instead of just attacking each problem point individually, now sketch out an ideal state VSM, illustrating goals for the items that lead to a leaner, more effective process. This vision needs to be agreed upon by the leadership and becomes the ultimate goal of the VSM project. The Value Stream Maps are used to communicate and guide the work. Use the attention-grabbing "kaizen burst" symbols on your current state VSM to clearly communicate the coming improvements. (Kaizen is a Japanese word roughly translating as "good change" or "continuous improvement.") Sometimes a series of future state Value Stream Maps are drafted before reaching the ideal state Value Stream Map.

14. Using the Value Streams Maps as your basis, create an implementation plan and carry it out. Consistently monitor the results in key metrics and implement further adjustments as necessary. You are on the path to continuous improvement.

LIMITATIONS OF STUDY

- The data have been obtained from various individuals from each department. The opinion of each people may vary by a negligible portion
- This study involves only the process of procurement of materials for production. This does not include the out-warding process of material for small value-adding process and service
- The results were reached based on the data collected and analyzed. There may be little variations in the percentage of reduction in lead time while implementing the proposal

DATA ANALYSIS

The individuals from the following departments were interviewed and the data collected from them were analyzed:

Department	Role
Planning Production and Control	PR creation
Sourcing & Procurement	PO creation
Customs	Material in-warding
Gate Security	Material in-warding
Stores	Material in-warding
Quality	Material in-warding

Below are the questions that were included in the questionnaires:

PLANNING PRODUCTION AND CONTROL

- What is the process involved in creating the PR? Importance of those process? Time for the process to happen?
- Approvals involved in creating a PR? (type wise)
- Time is taken to create a PR? (type wise)
- The frequency of creating a PR?
- Are the products delivered in the required time? If not, what the cause/reason and delayed by how long?
- What is the foresight period(reorder quantity)?
- What are the paper works involved?
- Any loss of production time due to delay in product delivery? Any Other similar situation?
- Who and how many in a team can use the SAP to raise the PR and how difficult is it?
- If any approving authority is on leave, what the contingency?
- Is creating PR through SAP is time-consuming and hinder the process? Can it be improved?
- Does the approving authority happen to forget approving PR owing to their busy schedule or does the PR gets buried in their huge mail list?
- What is the process of approving the PR? (How important it is)
- What does each approving authority check for before approving a request? (how important this is)?
- Is paperwork mandatory? Does the paperwork delay the process? By how much time?
- How crucial is the delay in delivery in this industry? Approximate impact on cost?
- What PR's are frequently created? Does all the PR creation & approval take the same time?
- What's the chance of making all the PR similar to MRP PR?

SOURCING & PROCUREMENT

- What is the average time for a PR- PO conversion?
- What is the Process of creating a PO? Please explain each step? Importance of each process
- Approvals involved in PO creation? What is the time taken to create each PO? Importance of these approvals?

- Are all these approvals required? Can some parties be just notified rather than getting approving?
- The frequency of creating a PO creation in a week?
- What are the paper works involved in the approval of a PO?
- How many in the SCM team have SAP access? Can more SAP credentials speed up the process?
- How difficult is creating a PO? How much time will it take to create a PO?
- According to you what is the main time-consuming process in this PR-PO conversion process?
- Does PO creation through SAP hinder the process? Can it be made simpler?
- What is the time frame between getting a PR and order being placed to the supplier? Why?
- What time does each signing authority take before providing approval? What does each authority verify for before approving a PO? How important is it?
- What is the normal SLA the delivery partner takes to deliver the product? Will the time or cost reduce if we consider a different delivery partner?
- What is the tariff of our delivery partner?
- Would the supplier charge more/less if the delivery time is altered?
- What is the time normally suppliers take to respond after sending out an RFQ, and after sending a counter quote? Can a mandatory response time of 36 hours be added as a criterion to fulfill if any new supplier wants to be added into the Approved supplier list?
- Can a supplier be blacklisted depending on his response rate?
- On average how many suppliers are considered for an order?
- On average, how many to/fro mail chains take place before both the parties agreeing on a price? Why? Can this be reduced?
- What is the frequency of a PO created getting rejected at some point in the approval process? At which point does it happen the most?
- If there's no supplier listed on the approved supplier list for a particular new product, what is the time it takes to find a new supplier? What are the means to find a new supplier?
- While finding a new supplier, what are the tests and conditions the supplier has to fulfill before placing the order? What is the SLA for this? Can some of this process be streamlined or eliminated to quicken the process?
- What process is taken to find other suppliers when we arrive at a point of a sole supplier?
- What is the contingency plan in place when a supplier hikes the price with no proper prior communication or reason? Have this happened before? How was this handled?
- Can there be a standard template to create SCN or can this process be automated provided the fact that most of the information in an SCN are same?

CUSTOMS

- The process involved in customs with respect to in-warding?
- What happens in this process?
- The average time for this process? Why?
- Is there a different process for domestic and international delivery? What is that?
- How is the record maintained and who maintains it?

- In past what were these records used for?
- For a delivery, how many days in advance are you notified?
- What are the approvals involved, if any? How much time does this take?
- Frequency in a week?
- What is the paperwork involved?

GATE SECURITY

- What is the average time to do the gate entry? Why?
- The process involved in doing the gate entry?
- Is there a different process for domestic and international delivery?
- Who does the gate entry and how is it done?
- How is the record maintained?
- In past what were these records used for?
- For a delivery, how many days in advance are you notified?
- Is there any approval for doing a gate entry?
- How many gate entries are done in a week?
- What are the paper works involved?
- What is the process involved with respect to in-warding process?
- What is the process involved while performing a physical check? Who in the stores team can do that? What is the average time for a physical check?
- How is this physical check documented after each physical check?
- What happens after physical check?
- How many days in advance are you notified about a delivery?
- What is the response time when a delivery is made at the gate? Who receives the delivery from the delivery partner at the gate?
- How is the record maintained? Has it been used before? For what reasons?
- Is there any approval after the physical check? If yes, what is the time taken for that?
- What is the process involved while creating GRN? Who in the stores team can do that? What is the average time for creating GRN?
- How is this GRN documented after creating each GRN?
- What happens after creating GRN?
- What is the process involved in moving the product to inventory after quality check? Who in the stores team can do that? What is the average time for this?
- How is this process documented?
- What happens after storing the products in the inventory?
- What are the paper works involved in all these 3 processes?
- What is the average time for all these processes?

QUALITY

- For what type of products are quality check done?
- What is the process involved in quality check? How much time does it take? Why?

- How many in the team does the quality check?
- What are the approvals involved? Time for each approval?
- What is the average time for a quality check?
- How is this record maintained? For what reasons have these been used for?
- How early are you notified of the quality check?
- What are the paper works involved? Can this be eliminated?
- What happens when a product is rejected?
- How much time is taken to respond when notified for a quality check?
- Who informs/take the decision you that the quality check has to be done for a particular product? At which point of the process is this decision taken?
- How much time does the quality team take to provide their approval?

STORES

- What are the process involved with respect to in-warding process?
- What are the process involved while performing physical check? Who all in the stores team can do that? What is the average time for physical check?
- How is this physical check documented after each physical check?
- What happens after physical check?
- How many days in advance are you notified about a delivery?
- What is the response time when a delivery is made at the gate? Who receives the delivery from the delivery partner at the gate?
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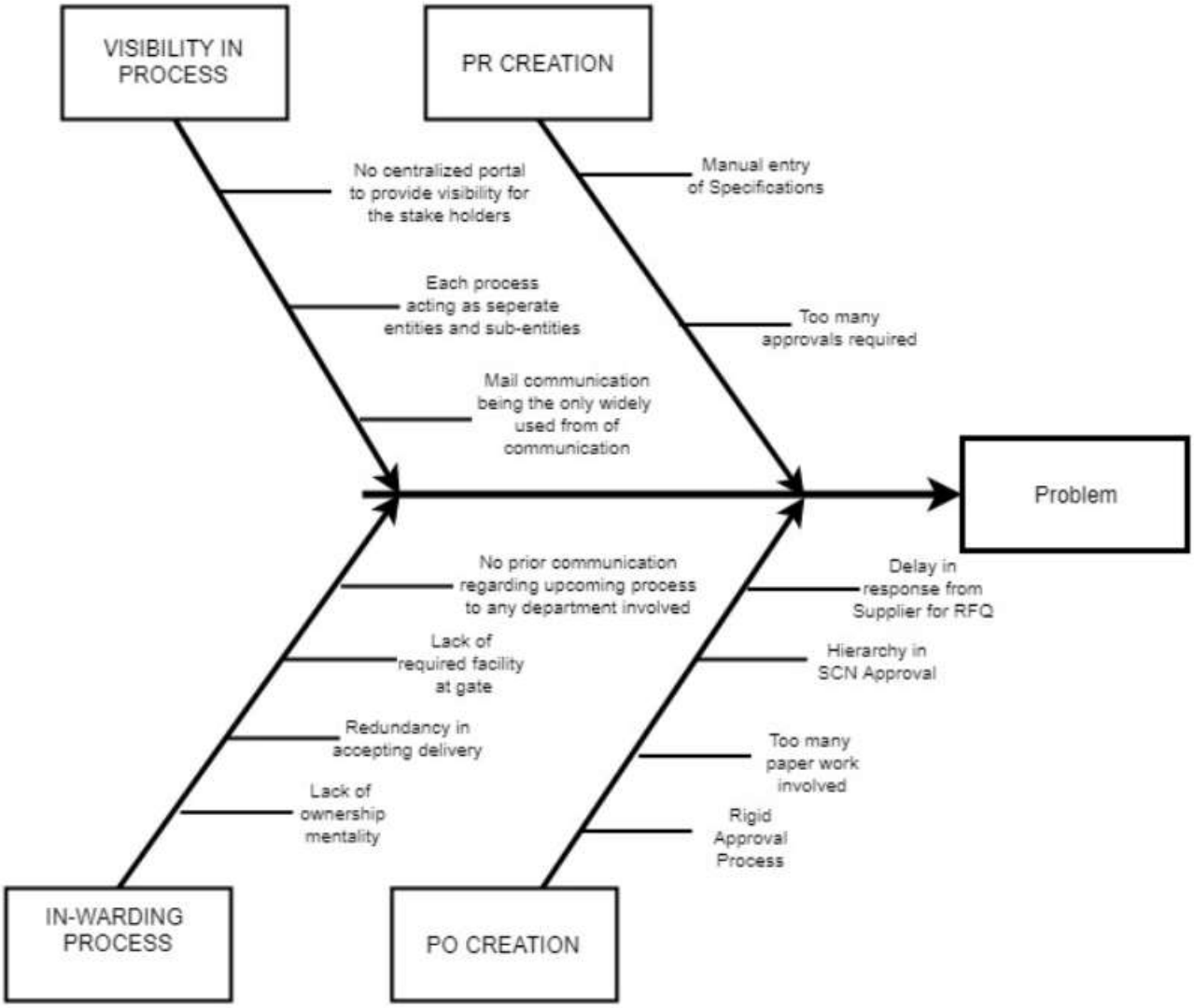
Fish and Bone Diagram:



ANALYSIS REPORT

PLANNING PRODUCTION AND CONTROL

- Creation of PR involves 3 approvals, from the supervisor, the head of the department, and program manager.
- To create a manual PR, it takes an approximate 10 mins to create a single PR. This is due to the reason that, the required specifications have to be manually fed into the SAP.
- The MRP system generally analyses the remaining stock and creates PR when the stock goes below the reorder point
- Products sometimes don't get delivered on time to the production line because the internal approvals and verifications, delayed the process of placing the PO to the supplier
- For reordering purpose 3 methods are used
    a. Sales order planning is used for detailed parts. These are high-cost materials and order is placed only as per requirement
    b. Consumption order quantity or reorder quantity is used for low-cost items. The order is placed by approximately determining the requirement
- PR can be raised by everyone in the PPC team. They use T code to raise different types of PR
- If any approving authority is on leave, it can be approved by his subordinate or peers
- When there is a huge mail list in the mailbox of the approving authorities, there is a fine chance that the communication mail sent regarding approval can be approved in it
- Before approving, the supervisor checks for materials and quantity, Program manager checks for value and purpose, to confirm if the order can be contained within the available budget. SCM checks the quantity available, confirming if the PR should necessarily be raised.
- Paperwork is not mandatory. It can be digitized
- It is an assemble–to– order (ATO) industry. Therefore, they don't maintain a safety stock. This is because the raw material is not procured from the supplier in bulk quantities. Moreover, the size of certain materials is too huge to maintain an effective safety stock inventory.
- The delivery time of the material is quite crucial in this industry. But it is not as crucial as in an automobile industry. But still, delay in delivery can shut the production line since they don't carry safety stock

SOURCING AND PROCUREMENT

- The average time taken to convert a PR into PO is 10 days. But this may go up to 20 days for some particular order (detailed orders)
- In the process of creating a PO, initially, an RFQ is sent to a set of suppliers from the ASL, which is followed by negotiations. When a price is been accepted by both the parties, a steering committee note is prepared to get approvals from all the approving authority
- After the SCN is approved, it involves 3 more approvals before releasing the PO to the supplier
- The number of approvals involved in placing a PO is listed below based on the cost of the material

Cost	No. of approvals
<500000 (Rs)	6
5,00,000 – 5,00,00,000	8

>5,00,00,000	10

- It normally takes 2 days to obtain all approvals in SCN
- The approval authority involved in SCN are:

Strategic Sourcing Executive
Planning Production & control Lead
Supply chain Head
Program Manager
Finance Head
Operation Head

- Normally 6-8 PO's are created in a week
- Paperwork involved in placing a PO is SCN and PO approval
- Currently, in a team consisting of 20 people, 15 people have SAP access
- It normally takes 10 minutes to create PO for one-line item
- Negotiation and the approvals are the major time-consuming factors in this process
- Blue dart is used for domestic delivery and DHL is used for international deliveries. The team tried working with Fed Ex earlier for international delivery. But this didn't work because the delivery time of DHL was quicker than Fed Ex
- The supplier usually takes 3-4 days to respond to an RFQ
- The supplier can be blacklisted based on his response rate
- When a PR is received, minimum 3-4 suppliers are approached with an RFQ
- On average 4 mail chains are exchanged between each Supplier and the internal team before an L1 supplier is decided
- There is a 25% probability that the SCN can be rejected at the last stage of approval owing to various reasons
- If there is no supplier in the ASL for a particular material, it takes 2-3 days to find a new supplier in the market. Internet and contacts are the main media used for this purpose
- When a new supplier is found, the supplier has to fulfill certain conditions like registration with the government, holding a valid GST number, possessing certain quality certifications etc. It takes 3-4 days to complete this entire verification process

CUSTOMS

- The customs have a different process for International and domestic deliveries. For domestic, they are not informed in advance. So only when the delivery reaches the gate of the company, they are notified by the gate security personnel. Only then, they start verifying the documents to get it approved. Only after getting this approved, the gate entry can be initiated
- In case of international deliveries, the customs are notified, as soon the product leaves the supplier's place overseas. Therefore, the customs team start working on the BOE, before the product reaches the Indian airport. Other paper works are carried out when the product reaches the gate of the company.
- Since TASL is an SEZ zone, the approval of SEZ officer is required in both domestic and international deliveries

- The check for invoice, supplier name, GST from the HSN number, check if the supplier has paid the taxes if the not separate document is generated for the delivery
- The record is maintained in the SEZ portal
- On an average, 90-100 international and 50 domestic delivery are received per month
- Paper works involved are Invoice, AWB, Packing list, BOE, and DTA(SEZ)

GATE ENTRY

- When the delivery arrives at the gate, the product can be accepted only by the stores personnel. If the stores personnel is not present at the gate, the delivery is made to wait or sent back
- After receiving the delivery, the docs are sent for customs approval
- Once the customs approve it, gate entry is done in the register and then fed into the SAP system. Gate entry is completed only after the entry into the SAP system is done
- The entry into the SAP system is not done instantly, but only once a day. This is because, the computer to feed in this info is not present at the gate security, but the security main office which is 500m away from the gate security cabin. Therefore, the entries for deliveries made in a day is collected and fed into the SAP system only in the evening
- Delivery challan, PO, Invoice are required to make a gate entry
- They follow the same process for both domestic and international deliveries
- The security personnel are not informed prior regarding the upcoming delivery
- On an average, 40-50 deliveries are received in a week

QUALITY CHECK

- Quality check is done for all detail parts and high precision items. It's not done for standard items
- Normally visual check is done for damage, and parts per b/p.
- A sample test is done for consumables
- After the quality check is done, the stamping authority stamps in the quality check form confirming the materials has passed the quality check
- Not everyone in the team can provide this stamp
- The average time for the quality check is 1 day
- There is no prior notification regarding the product until the physical check is completed
- When a material is rejected or needs more documents to verify the material, the product is moved to the inspection area. It stays there until further action is taken
- The quality inspector takes the decision if a quality check is done for a particular material

STORES

- The stores personnel checks for PO, packing list, Invoice, and AWB before receiving the delivery at the gate
- After gate entry, the physical check is done against the packing list, once the physical check, a sign is obtained from the stores personnel who carried out the physical check
- After the physical check, GRN is created in SAP followed by a Quality check

- If the product passes the quality check, the materials are taken to the stores and arranged in their respective locations by ‘binning’ process. If the quality rejects the material, the material is moved to the ‘under inspection’ phase
- When the shop floor requires the material for production from the stores, they need to fill an MR form for the stores to issue those materials to the concerned team
- When the delivery is made at the gate, no prior information is given to the stores personnel who needs to collect the delivery at the gate. There is a delay in this response time
- When creating a GRN, they check for customs approval, availability of all the documents and all the values should match
- The quality team should sign in the GRN once the materials pass the quality check
- Once the GRN is complete, its passed on to the finance team
- GRN and MR are the paper work involved in this process
- On an average, this phase takes 3 days to be completed

PROPOSAL
AND
RECOMMENDATIONS

PROPOSAL

An extensive study was carried out and inputs were gathered from multiple stakeholders in the process and a comprehensive conclusion was reached. From the study, it can be concluded that the delay in the process is caused by the lack of streamline in the process. Each process exists as a separate entity and further sub-entities in the organization. And therefore, the communication link is often hindered due to this reason which leads to the delay. Another reason I believe that leads to the delay is excessive human intervention involved which may contribute to parallax errors and slowness in the process. In the scope of procuring a material that adds value and enables a process, mail and phone communication are the main forms of communication used to interact with stakeholders in the process. Due to this the process time is hugely dependent on the various stakeholders.

Therefore, I propose a model which eliminates the redundancies in the internal processes and provides end-to-end visibility to all the stakeholders in the entire process. This can be done by designing a portal to integrate the entire process.

This portal can be used by all the stakeholders involved in this process. This portal can be installed into all the personal computers in the firm. The software can be designed to have an icon fixated in the bottom right corner of the taskbar in the personal computer. When a member of the production team needs a material to be procured for production, that person will have to log into the portal and create a PR through the portal. Once the required details are entered, a unique reference number will be created for the request. This further goes to the approval of the approving authorities. Since the icon always stays active in the bottom right corner of the screen, the icon will be continuously displaying the notification when the approving authorities have any approvals due, so that they will be constantly reminded that they have a request that needs to be approved. This portal can also have a mobile application interface that will be compatible in both android and IOS platforms. So that the approving authorities will be constantly reminded by the notification the application gives them and it will be very easy for them to approve any request that is been raised. When the PR gets raised, the portal indicates that the particular request has moved to the next phase, i.e. creation of PO. Likewise, the portal moves the request to the next phase once the current phase is approved. It also displays in the portal, the progress of each request created.

General Work Breakdown structure:

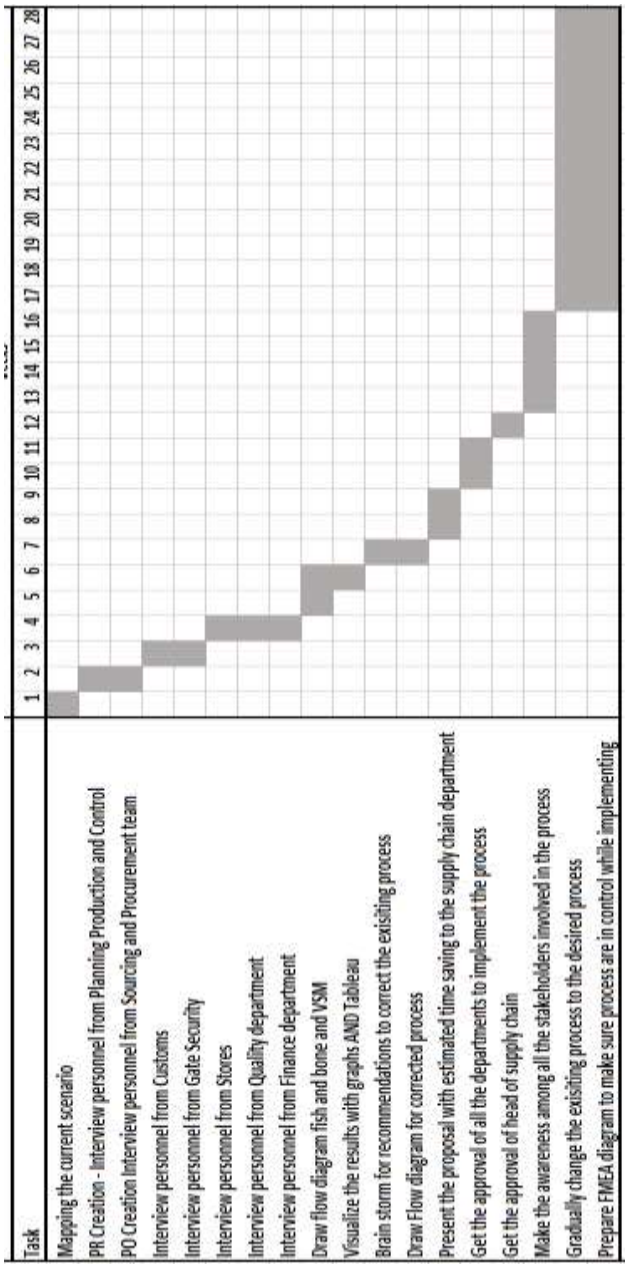
Process	Time(weeks)
Mapping the current scenario	1
PR Creation - Interview personnel from Planning Production and Control	1
PO Creation Interview personnel from Sourcing and Procurement team	1
Interview personnel from Customs	1
Interview personnel from Gate Security	1
Interview personnel from Stores	1
Interview personnel from Quality department	1
Interview personnel from Finance department	1
Draw flow diagram fish and bone and VSM	2
Visualize the results with graphs AND Tableau	1
Brain storm for recommendations to correct the exisiting process	1
Draw Flow diagram for corrected process	1
Present the proposal with estimated time saving to the supply chain department	2
Get the approval of all the departments to implement the process	2
Get the approval of head of supply chain	1
Make the awareness among all the stakeholders involved in the process	4
Gradually change the exisiting process to the desired process	12
Prepare FMEA diagram to make sure process are in control while implementing	12
Total Time Period	**28 weeks**

Detailed Work Break down structure:

	Process	Time(weeks)
1	**Mapping the current scenario**	
	1.1 Divide the entire process into 4 divisions	
	PR CREATION	
	1.1.1 Interview personnel from Planning Production and Control	1
	Interview personnel from Sourcing and Procurement team	1
	PO Creation	
	1.1.2 Interview personnel from Sourcing and Procurement team	1
	Delivery of order	
	1.1.3 Interview personnel from Customs	1
	1.1.4 Interview personnel from Gate Security	
	1.1.5 Interview personnel from Stores	
	1.1.6 Interview personnel from Quality department	
	Paymen to supplier	
	1.1.7 Interview personnel from Finance department	1
2	**Analysis**	
	2.1 Draw Flow diagram for exisitng process	
	2.1.1 Draw flow diagram for PR creation	1
	2.1.2 Draw flow diagram for PO creation	
	2.1.3 Draw flow diagram for after creating PO	
	2.1.4 Draw flow diagram for Inwarding process	
	2.2 Draw Fish and Bone Diagram	2
	2.3 Perform Value Stream Mapping	
	2.4 Get numerical value of time consuming in current process	
	2.5 Visualize the results with graphs	1
3	**Work on corrective measures**	
	3.1 Brain storm for recommendations to correct the exisiting process	1
	3.2 Draw Flow diagram for corrected process	
	3.2.1 Draw flow diagram for PR creation for corrected process	
	3.2.2 Draw flow diagram for PO creation for corrected process	
	3.2.3 Draw flow diagram for after creating PO for corrected proces	1
	3.2.4 Draw flow diagram for Inwarding processfor corrected proce	
	3.3 Visualize the time and cost saving after implementing the corrective me	

4	**Implement the process**	
	4.1 Present the proposal with estimated time saving to the supply chain de	2
	4.2 Get the approval of all the departments to implement the process	2
	4.3 Get the approval of head of supply chain	1
	4.4 Make the awareness among all the stakeholders involved in the proces	4
	4.5 Gradually change the exisiting process to the desired process	12
	4.6 Prepare FMEA diagram to make sure process are in control while imple	12
5	**Submi the final rpeort**	
	Total Time Period	**28 weeks**

Gantt Chart:



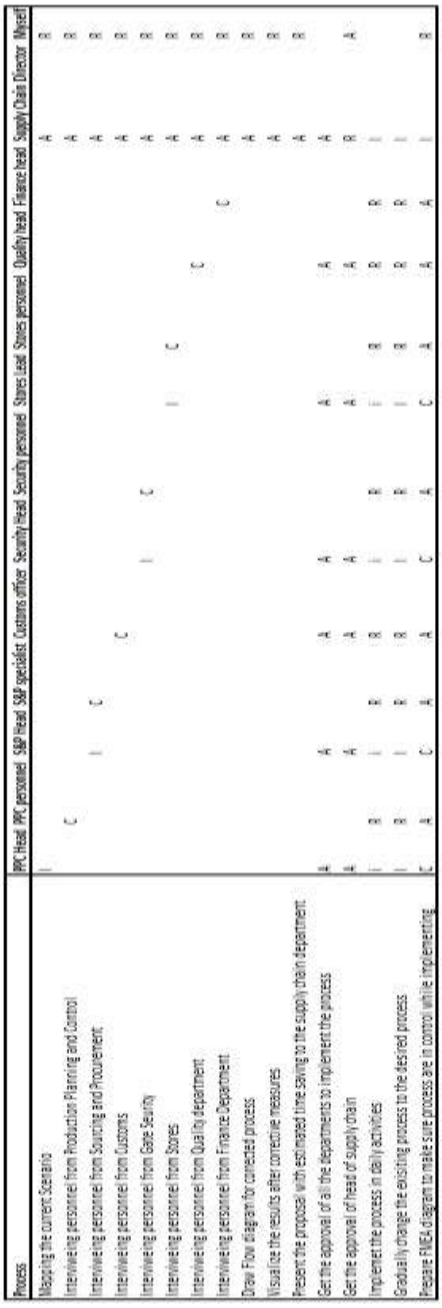
M & E Framework:

	DEFINITION How is it calculated?	BASELINE What is the current value?	TARGET What is the target value?	DATA SOURCE How will it be measured?	FREQUENCY How often will it be measured?	RESPONSIBLE Who will measure it?	REPORTING Where will it be reported?
Goal	By getting real estimate from the employees in different teams and performing time study	174 hours to complete the entire process	90 hours	By doing time study, using the PO that will be created for each orders, SAP records	For each PO after it is closed, frequency of every week	Supply Chain Specialist in the procurement team	Corporate supply chain head
Outcomes	The people from each team were interviewed, time study for each part of the process in each phase was calculated for the PO number LT17589	174 hours	93.75 hours	Time study was performed, VSM analysis is performed, Pareto chart was drawn to find the main cause of the delay, Fish and Bone diagram used to find the cause and effect	Every week it was measured	Supply chain specialist measured it. A table was constructed to show the differnec between previous time frame and the current time expenditure. FMEA chart is used to track progress and prevent failure	Corporate supply chain head and the procurement team head,
Outputs	Calculation is done	174 hours	174 hours for procurement is reduced to 93.75 hours	Studies done to find the root cause of the delay and recommendations and change in processes were made to reduce the time wasted in each process	Every week	Supply chain specialist in procurement team	Corporate supply chain head and the procurement team head checked this and satisfied with the progress

High-Level Alternatives Analysis

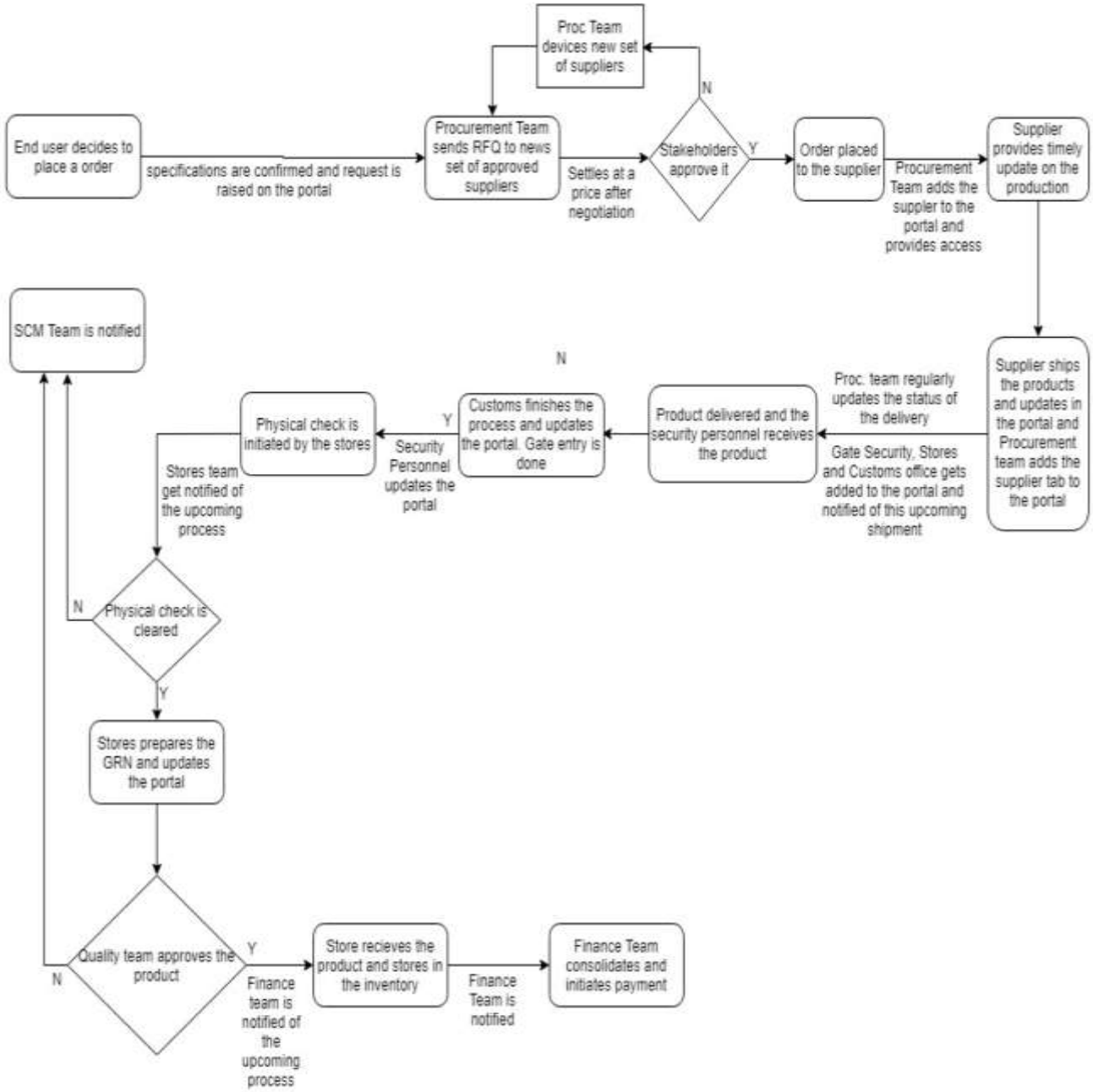
1. Other factors considered are to look for local suppliers who can pass the quality requirements so that the procurement cycle time reduces
2. Cost forecast for paying premium prices to get the shipment delivered faster

RACI Diagram:



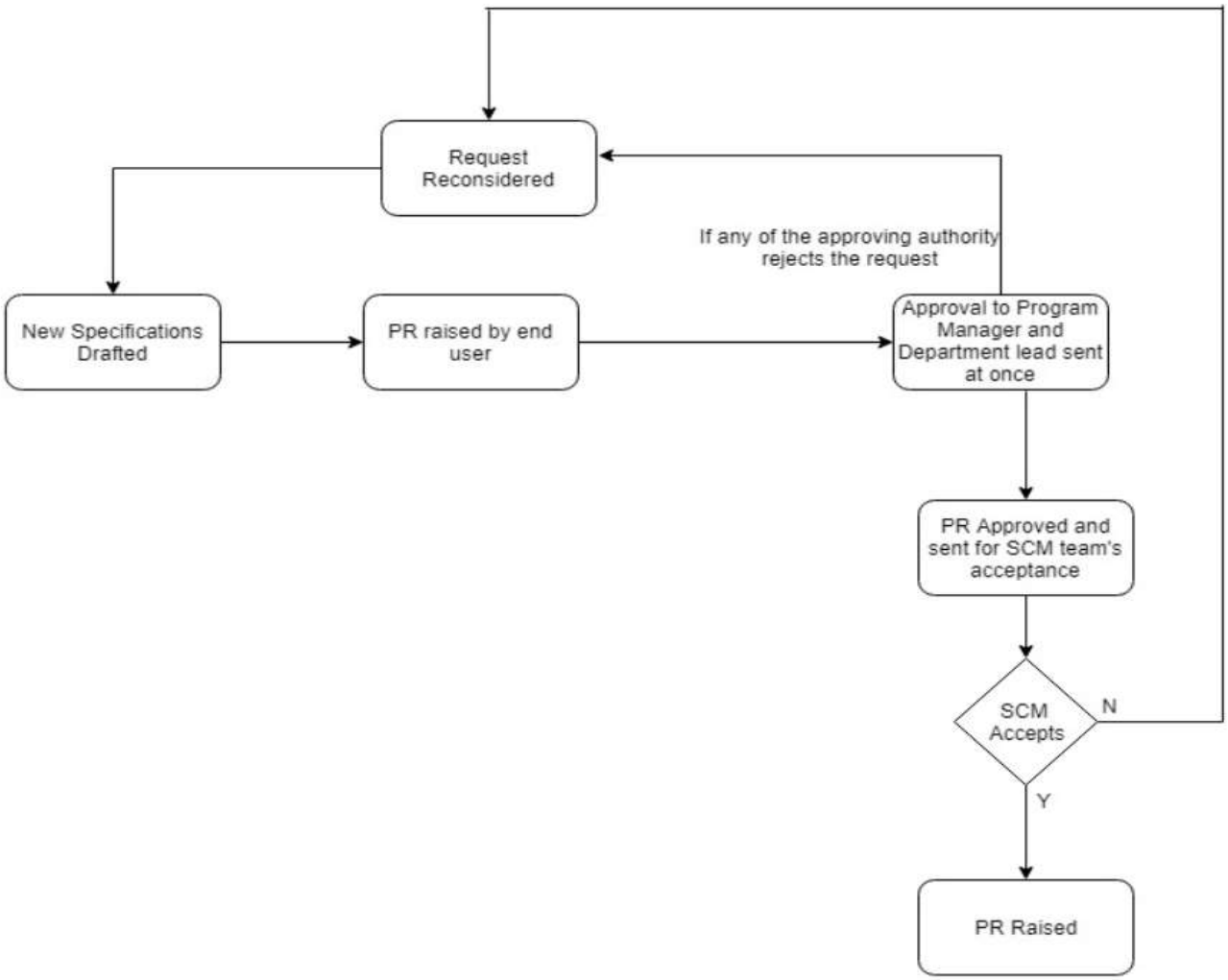
Process	RPC Head	RPC personnel	S&P Head	S&P specialist	Customs office	Security Head	Security personnel	Stores Lead	Stores personnel	Quality head	Finance head	Supply Chain Director	Wheelf
Mapping the current Scenario	I											A	R
Interviewing personnel from Production Planning and Control		C										A	R
Interviewing personnel from Sourcing and Procurement			I	C								A	R
Interviewing personnel from Customs					C							A	R
Interviewing personnel from Gate Security						I	C					A	R
Interviewing personnel from Stores								I	C			A	R
Interviewing personnel from Quality department										C		A	R
Interviewing personnel from Finance Department											C	A	R
Draw Flow diagram for corrected process												A	R
Visualize the results after corrective measures												A	R
Present the proposal with estimated time saving to the supply chain department												A	R
Get the approval of all the departments to implement the process	A		A		A	A		A		A		A	
Get the approval of head of supply chain	A		A		A	A		A		A		R	A
Implement the process in daily activities	I	R	I	R	R	I	R	I	R	R	R	I	
Gradually change the existing process to the desired process	I	R	I	R	R	I	R	I	R	R	R	I	
Prepare FMEA diagram to make sure process are in control while implementing	C	A	C	A	A	C	A	C	A	A	A	I	R

PROCESS FLOW:



PR CREATION

When an end user needs a material for the procurement line, the end-user creates a PR through this portal

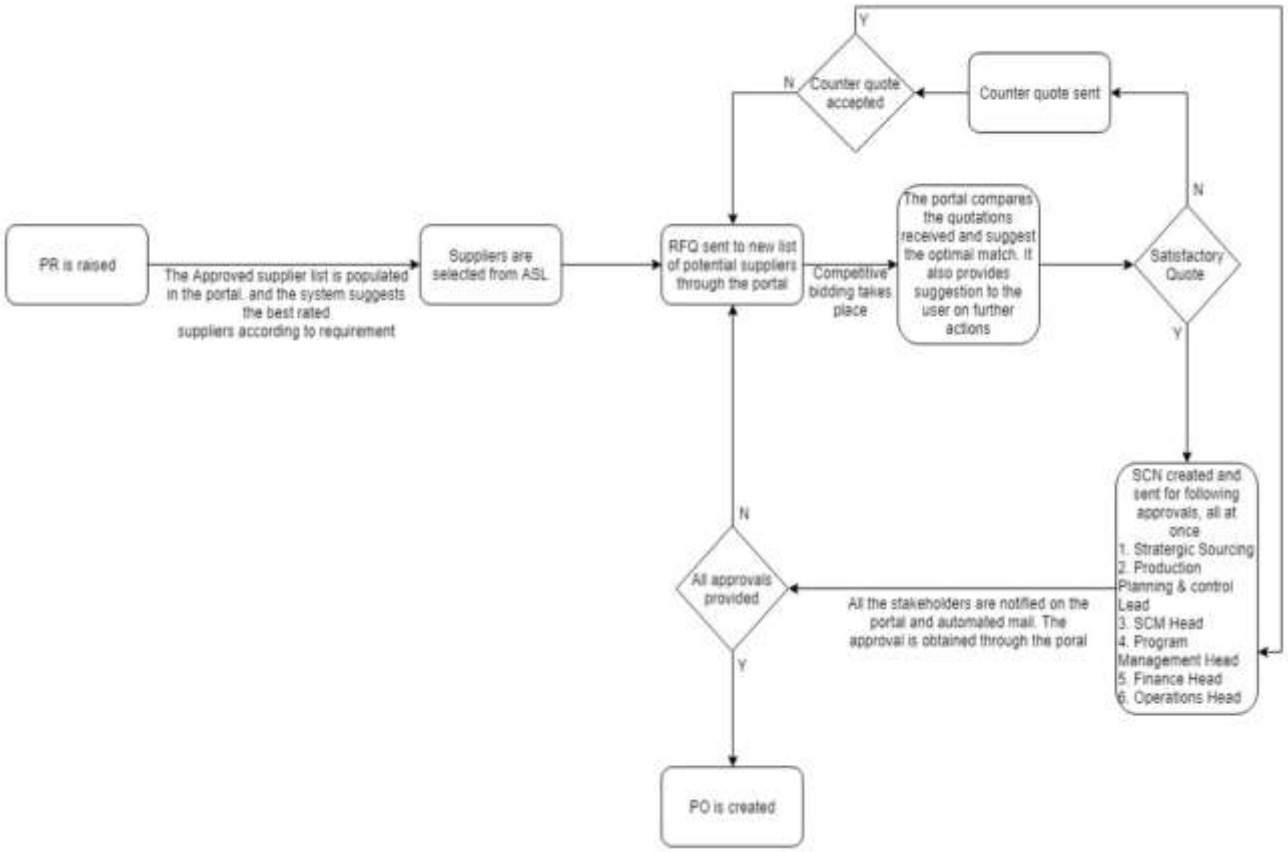


To create a PR, the end user needs to provide the following details:

S.NO
Materials Code
Description
Quantity
Unit of Measure
Required Delivery date
Material Group
Project Name
Preferred storage location
Purchasing group
Requester's Name

Once the user creates the PR, a unique PR# is generated and sent for approvals through the portal. Every user has their own unique account and access permissions. The created PR is sent to all the approving authority at once. The approving authority can approve it either through the interface installed on their computers or through the app on their mobile phones. Once all the approvals are provided, the PR is sent to the SCM team. The SCM team checks the available stocks to confirm if the PR is necessary. Once SCM team approves the PR is approved and moves to the next cycle

PO CREATION



The portal displays that the process has been moved from PR to PO stage. Once the procurement team receives the PR, the portal suggests the possible suppliers from the approved supplier list which is integrated into the portal. The sourcing specialist can select the required suppliers and send the RFQ as mails through the portal.

Once the suppliers respond with the quotes, the portal reads the emails and populates the quotes sent by every supplier for each material. It runs a program to sort the suppliers in the order of L1 supplier at the top followed by L2, L3 etc. The portal also suggests the user of further actions that could reduce the price, for eg: do the math and provide the user with the statistics of a possible decrease in price with an increase in order quantity, etc. The user can decide on further actions and reply to the potential suppliers.

After the competitive bidding, when the price is agreed upon by both the parties, the SCN note is created by the user and sent to the approval of all the approving authorities at once. After the authorities provide their approvals, the PO is finally raised and sent to the supplier. To send the PO to the supplier the following information need to be provided in the portal.

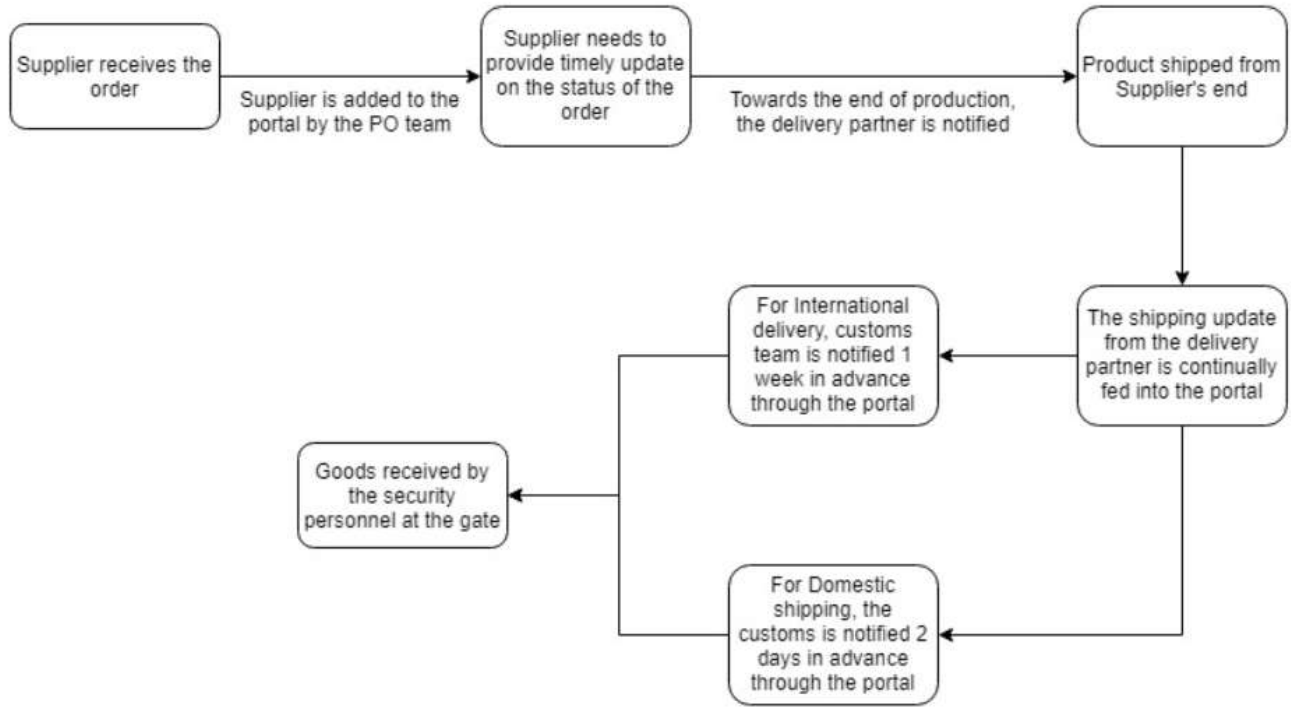
Order number
Date
Supplier Name
Supplier Address
Purchase group
SCN Number
Terms of payment
Delivery terms
SC number
Part number
Destination of material
HSN/SAC code
Agreed delivery date
UOM
Quantity
Unit Rate
Total Amount

These details should be furnished in the PO along with Terms and Conditions.

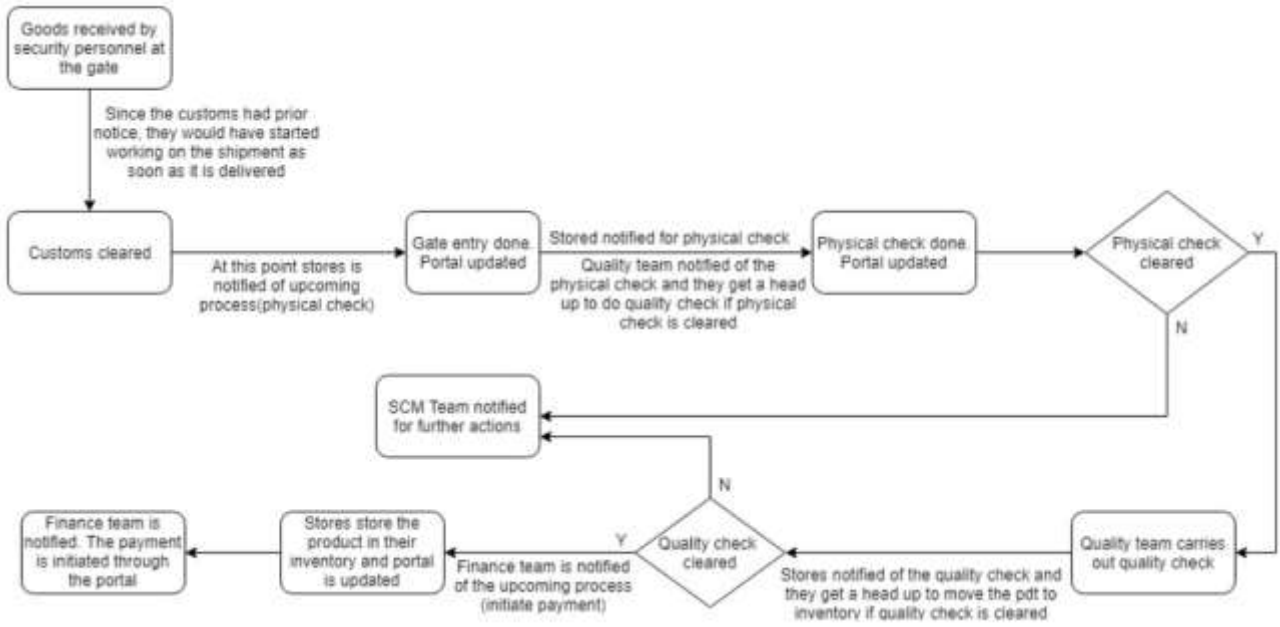
AFTER CREATING PO

Once the PO is placed, the supplier is added to the portal and the supplier is asked to provide us a timely update on the product. The interval of updates depends upon the lead time. We should note that the end user who created the PR can track the entire process through the portal because the portal displays the process that is currently undergoing, and all the stakeholders are given the same visibility. The end user can know the process that has been completed and can get an idea of the process and time remaining to get the material delivered. This provides the end user with the ability to plan accordingly.

Once the production is completed, the supplier should update the portal and mention the delivery partner through which the material is transported along with the tracking number. It’s the procurement specialist’s responsibility to track the package on the delivery partner’s website and manually update the status of the delivery on the portal.



IN-WARDING PROCESS



In the current scenario, the store representative is required to be present at the spot while receiving the delivery. The security personnel can be trained to do a basic search and receive the delivery. The customs team should have prior notification regarding the delivery. Therefore, they should be ready with the paperwork and provide approval for the security personnel to do the gate entry. It is strongly

advised that the gate security cabin is installed with a personal computer and the security personnel be given proper training so that they can complete the gate entry in a short duration.

When the customs provide their approval, the stores team should be notified to do the physical check. Therefore, the stores representative will be readily available at the gate to do the physical check as soon as the gate entry is done. The customs approval and gate entry get updated in the portal. Through this, the end-user will be aware that the materials have reached the company.

If the physical check is cleared, the stores team is notified to start creating the GRN. Meanwhile the Quality team is given a heads-up to do the quality check. By the time the GRN is created, the quality team will be available on the spot to do the quality check. When the Quality team passes the material, the portal is updated, and the stores team is asked to shift the material to the inventory. The Stores team stores the material in their inventory by binning process. The finance team also gets the notification of their upcoming intervention in this process. Once the material is moved to the inventory, the finance team is notified to initiate the payment and simultaneously the end user is notified about the availability of the material at the store. The end user team can start filling the MR, so that the store can issue the material to them when they submit the MR.

RECOMMENDATIONS

- In PR approval, Boss approval and HOD approval can be removed. Instead, they can be notified of the process and the only approving authority can be the Project Manager. This is because they will already be aware of the requirement and just notifying them will suffice
- The software should be designed in a way that data can be sourced directly from an excel file, rather than requiring a user to enter all the entries one after another
- A response time of 13.5 working hours (1.5 days) can be added to the list of conditions that a supplier should fulfill to be added to the approved supplier list
- The software should have an App interface which will make the process easier and quicker
- Once SCN is created, it can be sent for approval to all the approving authorities rather than following hierarchy. This is to avoid the situations of wastage of time when an SCN is approved by everyone in the pipeline but gets rejected at the final stage
- A separate data collection agent can be contracted to provide monthly data on the possible suppliers for materials already used in the plant or has the probability of being used.
- For domestic deliveries also, the customs can be notified once the consignment leaves the supplier's end
- The security personnel can be allowed and prepared to receive a delivery on their own rather than waiting for an individual from the stores to come down to the gate just to receive a delivery
- The security cabin at the gate can be installed with a personal computer so that the security personnel can do the gate entry instantly, therefore the process doesn't get stalled here
- A list of expected delivery can be generated every day and given to the security personnel
- The company can sponsor people in the quality team to earn the required certificates so that most of the individual will possess the stamping authority, therefore redundancy can be avoided
- The paperwork can be eradicated from most of the process involved

RESULT

The data obtained from the various stakeholders were tabulated and the following inference was obtained.

Stages involved	Time took currently - working hours(hrs)	Time after implementing - working hours (hrs)	Time saved(hrs)
PR CREATION (MANUAL PR's)	4	0.75	-3.25
APPROVALS FOR PR CREATION	9	4	-5
PLACING A PO	90	54	-36
APPROVALS FOR A PO	18	10	-8
INWARDING PROCESS-CUSTOMS	2	1.5	-0.5
GATE ENTRY	9	1.5	-7.5
STORES & QUALITY	36	18	-18
MOVING TO INVENTORY	6	4	-2
TOTAL	174	93.75	-80.25

The above tabular column contains the various steps involved in the process followed by the time taken by the particular step in the process currently. These values are depicted in hours. The values were tabulated by inferring data obtained from each stakeholder and their real-time experiences. These times mentioned are an average of values obtained from multiple stakeholders from the same department.

The next column consists of values that depicts the time the same process will take if the proposals and recommendation are implemented in the system. An extensive analysis was done on the answers obtained for the queries in the questionnaire. Each questionnaire and the answers from the stakeholders were evaluated and the above-mentioned values were derived.

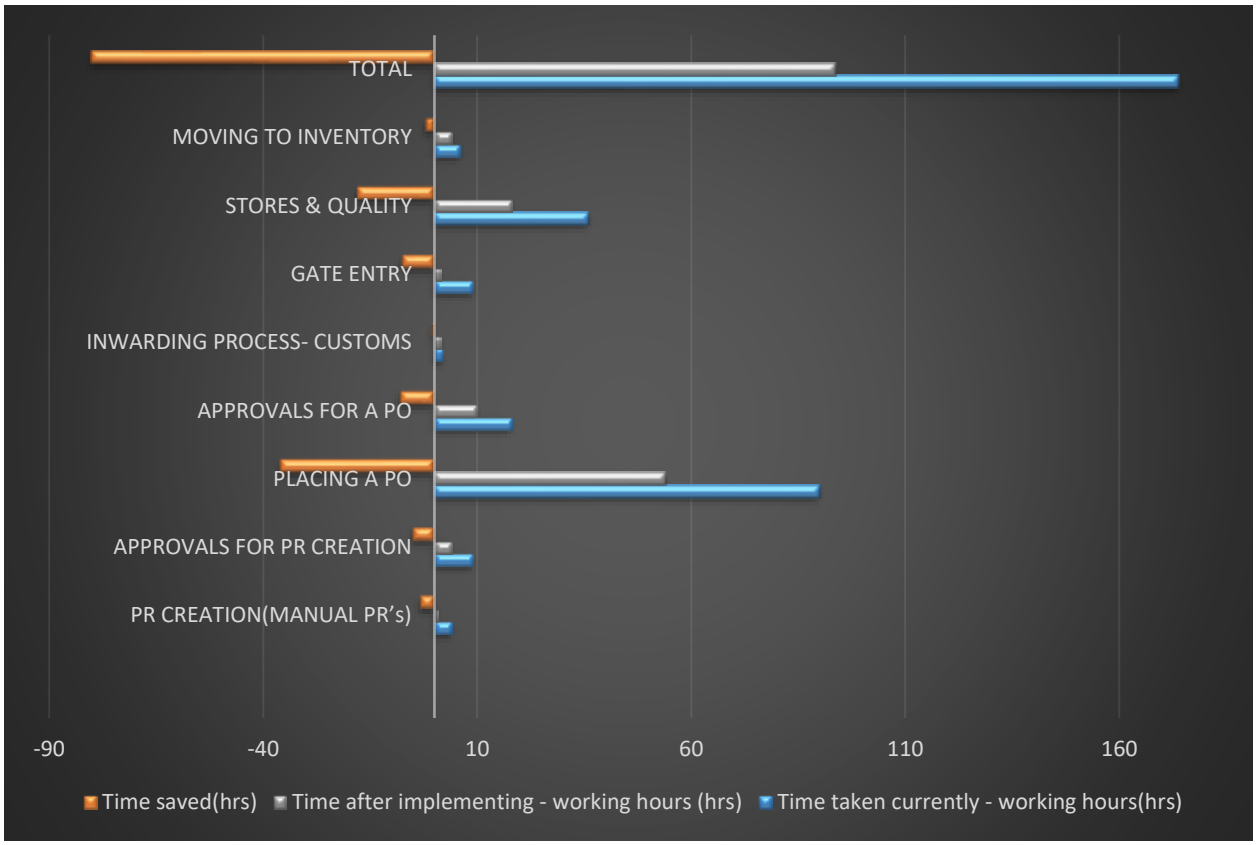
The next column portrays the time that will be saved for each step in the process. We can see that the lead time between the order being placed by the end user and the material being received by the end user is 174 hours on average. This is a precious time for a huge aero defense firm like TATA. From the next column we can see that when the proposal is implemented, the lead time comes down to 93.75 hours, which implies that 80.25 hours have been eliminated from the process.

Eliminating such large lead times can help the company in many ways. Some of them include,

- cost savings incurred from this reduction of lead time

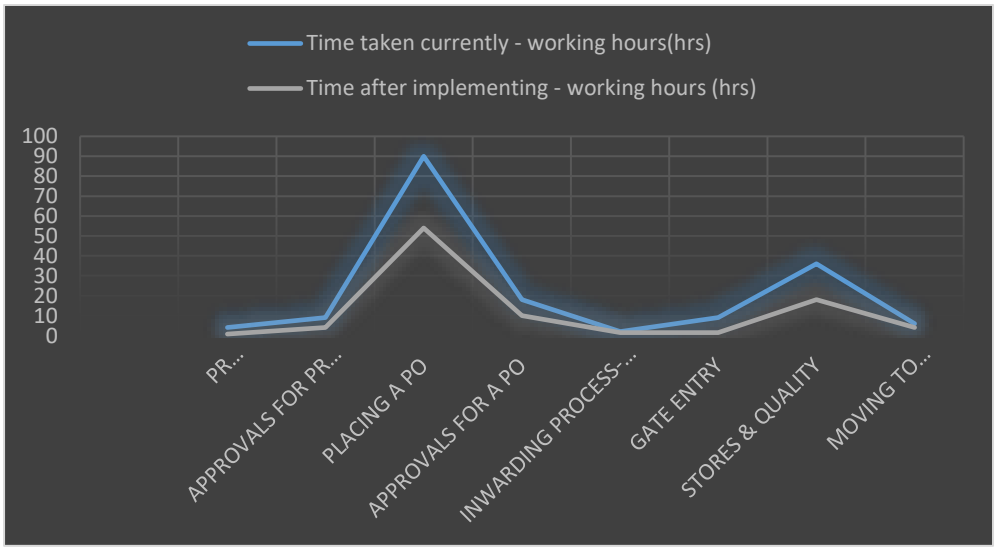
- more efficient supply chain
- Number of units can be produced in a year which in turn increases the revenue of the company
- the lead time of manufacturing a product for the customer reduces which in turn improves the relationship with the customer
- When TATA can produce the component at a much faster pace, it can quote the client a higher price since it can produce the product faster than any other aero defense company in the market

Hence, we can see that the reduction in the internal process time ultimately leads to cost saving and increased revenue for the firm.



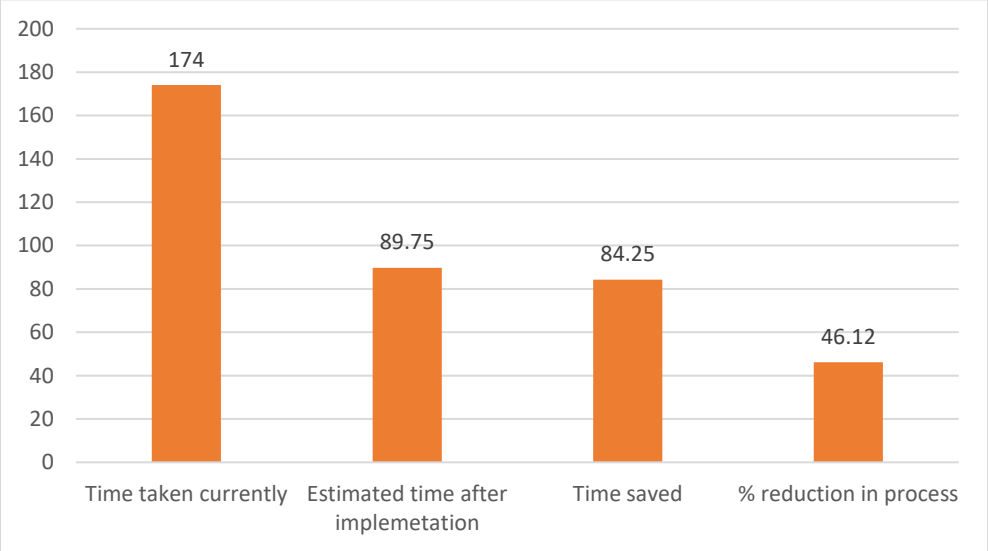
This graph represents the number of hours each process takes now (blue bar) and the time it will take once the proposal is implemented (white bar). This orange bar shows the time that we will be able to save, once this proposal is implemented

Stages involved	Percentage of time in current scenario(%)	Cumulative %	Estimated Percentage of time after implementation	Cumulative %
PR CREATION (MANUAL PR's)	0.95	0.95	0.33	0.33
APPROVALS FOR PR CREATION	5.71	6.66	2.17	2.50
PLACING A PO	57.14	63.81	62.54	65.04
APPROVALS FOR A PO	11.43	75.24	10.42	75.46
INWARDING PROCESS-CUSTOMS	0.48	75.71	0.65	76.11
GATE ENTRY	5.71	81.43	1.30	77.42
STORES & QUALITY	17.14	98.57	20.85	98.26
MOVING TO INVENTORY	1.43	100.00	1.74	100.00



This graph depicts each process in terms of percentage. The blue line depicts the time taken in the current scenario and the white line depicts the time it will take once the process is implemented. We can see that there is a drastic reduction in the time for the step 'placing a PO'.

Time took currently	Estimated time after implementation	Time saved	% reduction in process
174	89.75	84.25	46.12



The above tabular column and the graph shows the result that is obtained from this project. The graph shows that the time is taken for each process and then the last bar shows the percentage reduction in the lead time of the entire process which is 46.12%.

CONCLUSION

TATA Advanced systems is a huge industry that has clients all over the world in the fields of Aerospace and Defence. TASL partners global leaders in the aerospace and defense industry to deliver world-class components for defense and civilian aircraft. In an industry that has a strong presence in the global market of aerospace and defense, procurement cycle has a huge role to play. From the above-mentioned result, we can see that TASL will be able to shorten its procurement cycle by **46.12%**. When this result is achieved, it can help the company increase its revenues. It also means that work hour that is saved, indirectly contributes to a reduction in cost to the company. Therefore, this project when implemented in the company will result in both revenue increase and cost savings.

APPENDIX
&
REFERENCE

SAMPLE QUESTIONNAIRE

PR – PO CYCLE

QUESTIONNAIRE

Name	
Department	
Designation	
Date	

1. What is the average time for a PR- PO conversion?

2. What is the Process of creating a PO? Please explain each step? Importance of each process

3. Approvals involved in PO creation? What is the time taken to create each PO? Importance of these approvals.

4. Are all these approvals required? Can some parties be just notified rather than getting approving?

5. The frequency of creating a PO creation in a week?

6. What are the paper works involved in the approval of a PO?

7. How many in the SCM team have SAP access? Can more SAP credentials speed up the process?

8. How difficult is creating a PO? How much time will it take to create a PO?

9. According to you what is the main time-consuming process in this PR-PO conversion process?

10. Does PO creation through SAP hinder the process? Can it be made simpler?

11. What is the time frame between getting a PR and order being placed to the supplier? Why?

12. What time does each signing authority take before providing approval? What does each authority verify for before approving a PO? How important is it?

13. What is the normal SLA the delivery partner takes to deliver the product? Will the time or cost reduce if we consider a different delivery partner?

14. What is the tariff of our delivery partner?

15. Would the supplier charge more/less if the delivery time is altered?

16. What is the time normally suppliers take to respond after sending out a RFQ, and after sending a counter quote? Can a mandatory response time of 36 hours be added as a criterion to fulfill if any new supplier wants to be added into Approved supplier list?

17. Can a supplier be blacklisted depending on his response rate?

18. On average how many suppliers are considered for an order?

19. On average, how many to/fro mail chains take place before both the parties agreeing on a price? Why? Can this be reduced?

20. What is the frequency of a PO created getting rejected at some point in the approval process? At which point does it happen the most?

21. If there's no supplier listed on the approved supplier list for a particular new product, what is the time it takes to find a new supplier? What are the means to find a new supplier?

22. While finding a new supplier, what are the tests and conditions the supplier has to fulfill before placing the order? What is the SLA for this? Can some of this process be streamlined or eliminated to quicken the process?

23. What process is taken to find other suppliers when we arrive at a point of a sole supplier?

24. What is the contingency plan in place when a supplier hikes the price with no proper prior communication or reason? Have this happened before? How was this handled?

25. Can there be a standard template to create SCN or can this process be automated provided the fact that most of the information in an SCN is same

GLOSSARY

GDP	GROSS DOMESTIC PRODUCT
HAL	HINDUSTAN AERONAUTICS LIMITED
ISRO	INDIAN SPACE REASERCH ORGANIZATION
TASL	TATA ADVANCED SYSTEMS LIMITED
OEM	ORIGINAL EQUIPMENT MANUFACTURER
ATE	AUTOMATIC TEST EQUIPMENT
MCC	MISSION CONTROL CENTER
PBL	POTENTIAL BID LIST
CMS	COMBAT MANAGEMENT SYSTEM
UAV	UNMANNED AERIAL VEHICLE
PR	PURCHASE REQUEST
PO	PURCHASE ORDER
MSDS	MATERIALS SAFETY DATA SHEET
VSM	VALUE STREAM MAPPING
MSDS	MATERIALS SAFETY DATA SHEET
MRP	MATERIALS REQUIREMENT PLANNING
SLA	SERVICE LEVEL AGREEMENT
PC	PURCHASE CONTRACT
RFQ	REQUEST FOR QUOTE
SCN	STEERING COMMITTEE NOTE
ATO	ASSEMBLE-TO-ORDER
GRN	GOODS RECEIPT NOTE
ASL	APPROVED SUPPLIER LIST
GST	GOODS & SERVICES TAX
BOE	BILL OF ENTRY
BOL	BILL OF LADING
SEZ	SPECIAL ECONOMIC ZONE
HSN	HARMONIZED SYSTEM OF NOMENCLATURE
MIS	MANUFACTURING INSTRUCTION SHEET
AWB	AIR WAYBILL
DTA	DOMESTIC TARIFF AREA
L1	LEAST ONE

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