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## The Need for Advanced Sourcing Planning & Risk Mitigation Frameworks

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## Abstract

While engaging in sourcing initiatives within the supply chain domain, L&T Infotech has repeatedly encountered the need for manufacturers to align the sourcing of “long lead buy parts” to overall project time lines. This is because, when the sourcing of such “buy parts” is not critically evaluated and proactively initiated, these parts can directly contribute to Project Schedule Variance. Indeed, buy parts typically demand higher-end technology and are designed and manufactured by a limited number of suppliers. These parts have longer lead times and suppliers dictate the delivery time lines.

In such scenarios, it is imperative for manufacturers to adopt a strategy that appropriately advance sourcing by critically analyzing the lead times of “buy parts” and delivery schedules. The non-availability of these “buy parts” at the right time and place contributes to the delivery extensions, liquidity damages (LDs)/penalties associated and disruptions in the market that will impact a manufacturer’s bottom line.

This paper presents a framework on how to determine the most appropriate stage for initiating the sourcing of long lead items and identifying associated risks and the appropriate mitigation strategy.

## Sourcing Complexity

The sourcing of “buy parts” is one of the most critical functions within the whole supply chain of a typical manufacturing organization. This activity demands higher management involvement and directly influences the cost, timelines and, ultimately, the project feasibility.

Sourcing, by definition, is “identifying ‘buy parts’ and then selecting/developing suppliers” However, in reality, sourcing must be managed differently for each industry vertical (industrial products, ship building, aerospace & defense, automotive/off-highway) due to different needs, challenges, and customized requirements.

The illustration below depicts sourcing complexities as we move from an assemble-to-order manufacturing scenario to an engineer-to-order scenario. In today’s competitive market, the customer expects premium quality at lower costs, and within shorter time periods. These market realities demand a systematic and proactive procurement planning process.

We identify the key parameters which influence sourcing decisions and necessitate improved planning as:

- Higher “buy” content in the combination of make or buy
- Consolidated supplier base
- Uniqueness of the project
- The need for high end technology
- Cost and time pressures
- Stringent terms and conditions (liquidity damages / penalty)
- Strong compliance requirements

All these factors add up to the complexity of sourcing which impacts the overall lead time of buy parts and in turn the overall time line of the project. These realities make it imperative to plan sourcing proactively, systematically and if required, advance aggressively to meet delivery timelines.

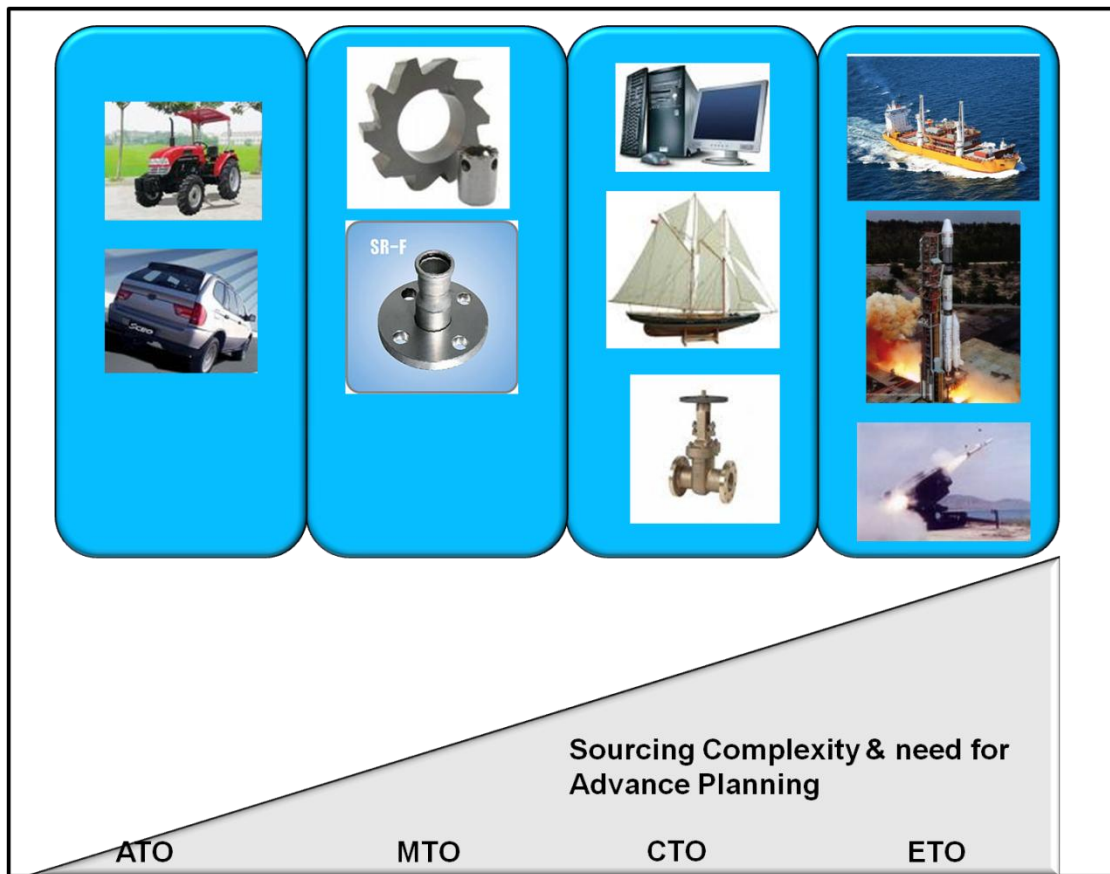


Fig 1: Sourcing variabilities by vertical segment

## Typical Project Scenario and the Need for Sourcing Planning

The figure below illustrates key project milestones from inquiry through delivery. The sourcing of “buy parts” remains among the critical activities of the overall project plan and has the greatest impact on the project schedule. The sourcing of buy parts is usually project specific and depends upon the sourcing BoM, experience with suppliers, lead time information and project completion objective.

Based on these stated dynamics, a few “buy parts” from the sourcing BOM are identified as long lead time items. The key challenge is to accurately ascertain in advance the time required for sourcing long lead items so that it does not contribute to project schedule variance. To avoid schedule variance and to adhere to the agreed timeline, manufacturers tend to deliver incomplete equipment to the site/customer and then wait for the arrival of long lead item. Because of this, the manufacturers incur additional expenses in the form of man hours, packaging and transportation, and taxes for such supplies.

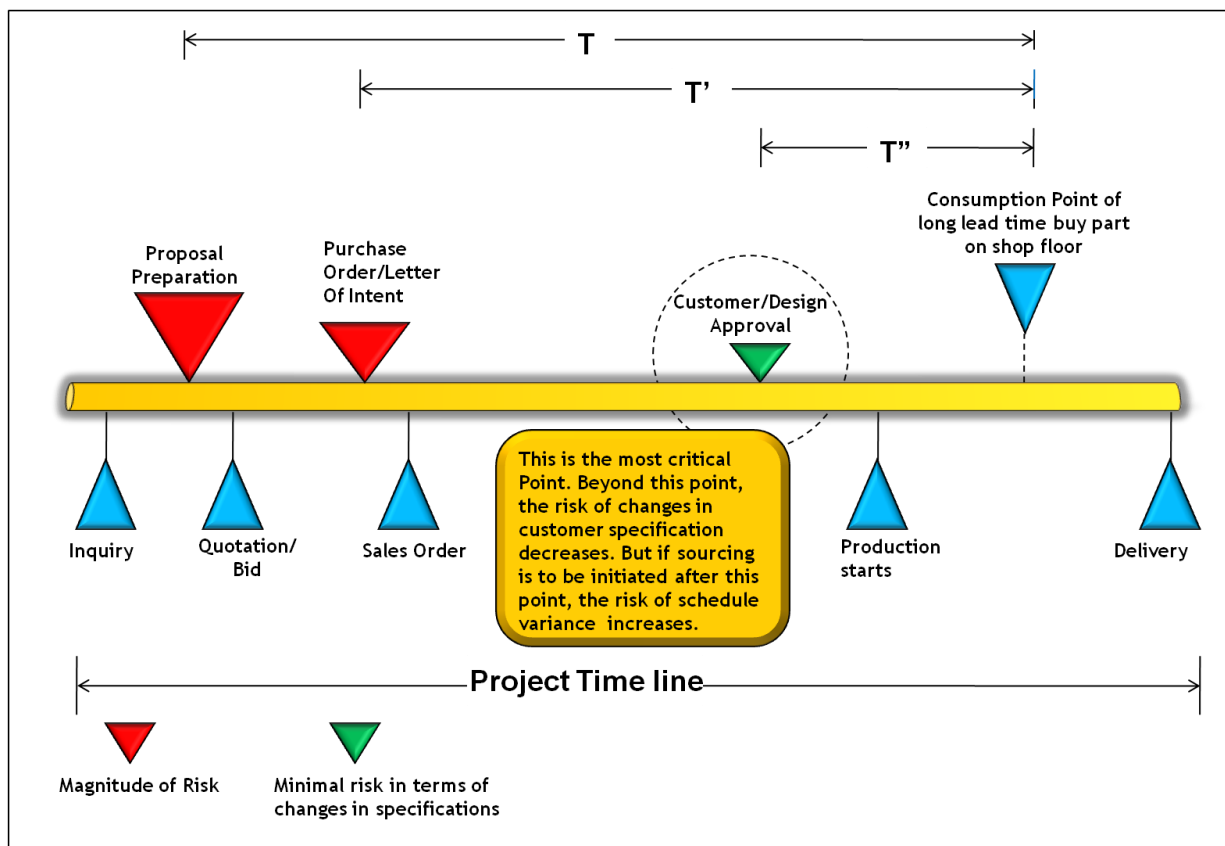


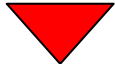





Fig 2: Typical Project Milestones

The proposition of initiating sourcing for long lead items before obtaining the customer’s approval comes with certain risks. For instance, what if sourcing is initiated before obtaining customer approval and subsequently specifications undergo changes? Therefore this proposition needs strong risk mitigation mechanisms in place to be able to take informed decisions when executing “advanced sourcing”.

On the other hand, if the risks of advancing the sourcing is not taken, long lead items will contribute to project delivery over-run and hence to liquidity damages/penalties. Such liquidity damages and/penalties can be significant and are typically garnered as a percentage of the overall project contract value. They are generally defined in contract documents and have legal implications.

The table below illustrates sourcing scenarios and their impact on risk at different project milestones:

Project Milestone : Stage at which long lead time items are procured:	BOM Clarity	Sourcing Scenario		Magnitude of Time	Liquidity Damage /Penalty
		Risk of Material Wastages  (Magnitude)	Gain in Time  (Magnitude)	T>T'>T"	
Proposal Making	Lowest clarity because only high level Estimation BOM which is used for Proposal, is available	<b>Risk: Highest</b>  <ul style="list-style-type: none"> <li>Project not yet awarded /Opportunity is not yet matured</li> <li>Specifications are not frozen</li> </ul>	<b>Gain : Highest</b>  <ul style="list-style-type: none"> <li>Possibility of project delivery exceeding due to long lead time items: Negligible</li> </ul>	T= Proposal Stage to consumption Stage	Negligible
Purchase Order/ LOI	low clarity because only high level Estimation BOM which is used for Proposal, is available	<b>Risk: High</b>  <ul style="list-style-type: none"> <li>Susceptible to changes in specifications as detail engineering is not yet done</li> </ul>	<b>Gain : Considerable</b>  <ul style="list-style-type: none"> <li>Possibility of project delivery exceeding due to long lead time items: Less</li> </ul>	T'= Purchase Order/LOI Stage to consumption Stage	Low



Customer Approval	Detailed Engg. - BOM is available Engg. designs/details are approved by customer	Risk: Lowest 	Gain: Less  ▪ Susceptibility to specs changes: Minimal	T”= Customer Approval Stage to consumption Stage	High
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Fig 3: Different scenarios of sourcing planning

## Sourcing Planning Challenges

The following are crucial project management challenges manufacturers face from a sourcing planning perspective:

Identification of the project specific long lead items

Analysis of risk due to customer driven changes/specifications if items are sourced in advance

Analysis of impact of delayed sourcing on overall project schedule variance and liquidity damages

Qualification and quantification of risk of sourcing items & risk mitigation mechanism

Negotiation with Customer & Supplier in case of project schedule impacted by long lead items

Visibility on overall advanced sourcing activities from project management perspective

## Risk mitigation Mechanism

L&T Infotech proposes an innovative approach that mitigates the risk of advanced sourcing planning. This approach is based on the fundamental principles of “management by exception” and risk minimization by “building transparency”.

Project specific long lead items BoM is analyzed for “susceptibility to specification changes” versus cost. Each long lead item is plotted on a scatter diagram using these two metrics. Based on the quadrant an item falls in, the risk mitigation treatment differs.

- **Customer approval mitigation strategy:**  
If an items falls into the category of the **High Risk-High Value** quadrant, they will not be sourced unless the manufacturer obtains formal customer approval
- **Department head approval imperative:**  
If an items falls into this category known as the **Low Risk-High Value** quadrant, there would be no sourcing unless the department head authorizes a formal go-ahead
- **Project manager approval:**  
If an items falls into the **High Risk-Low Value** quadrant, the items would not be sourced unless the project manager allows the buyer to go ahead with the sourcing
- **Safety stock strategy:**  
If an items falls into the category of the **Low Risk-Low Value** quadrant, they can be inventoried to safety stock

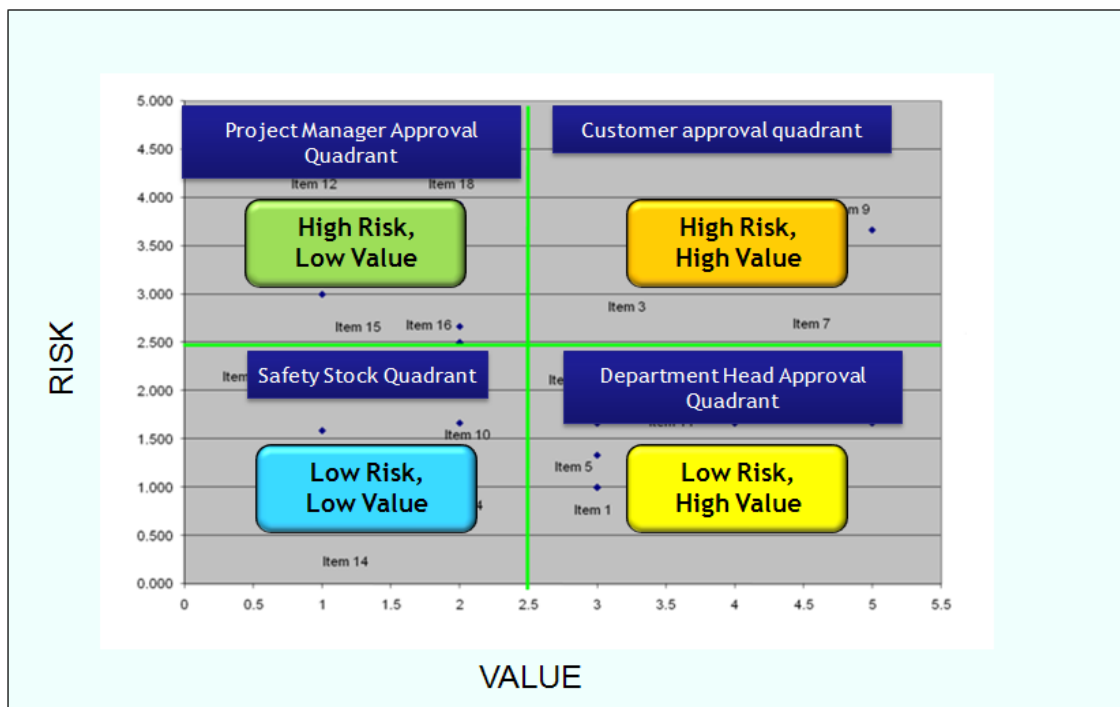


Fig 4: Scatter diagram to show risk vs value analysis

## Our Consultative Approach of addressing these Challenges

L&T Infotech proposes a consultative approach to address the “advance sourcing and risk mitigation” challenges of manufacturers, leveraging its consultative approach as depicted below.

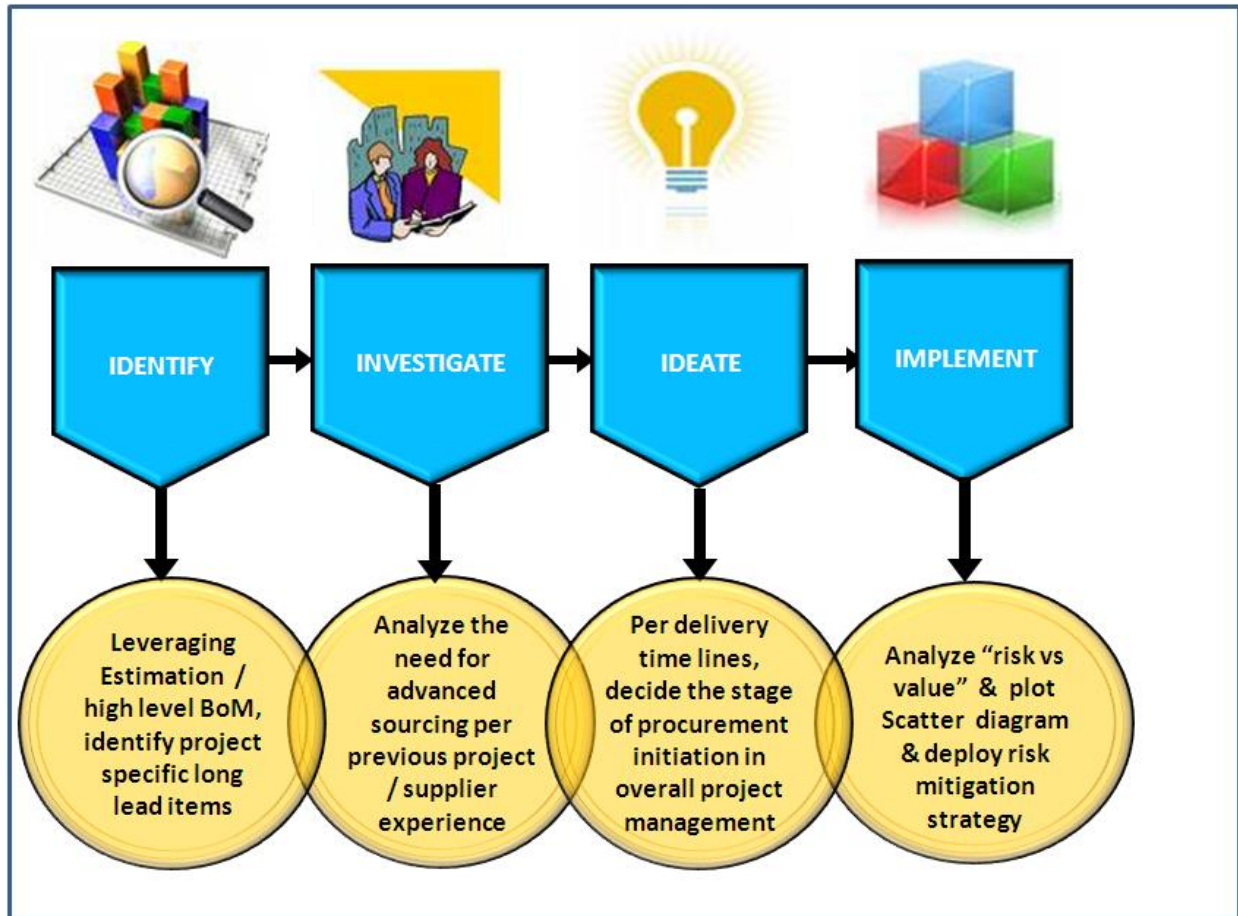
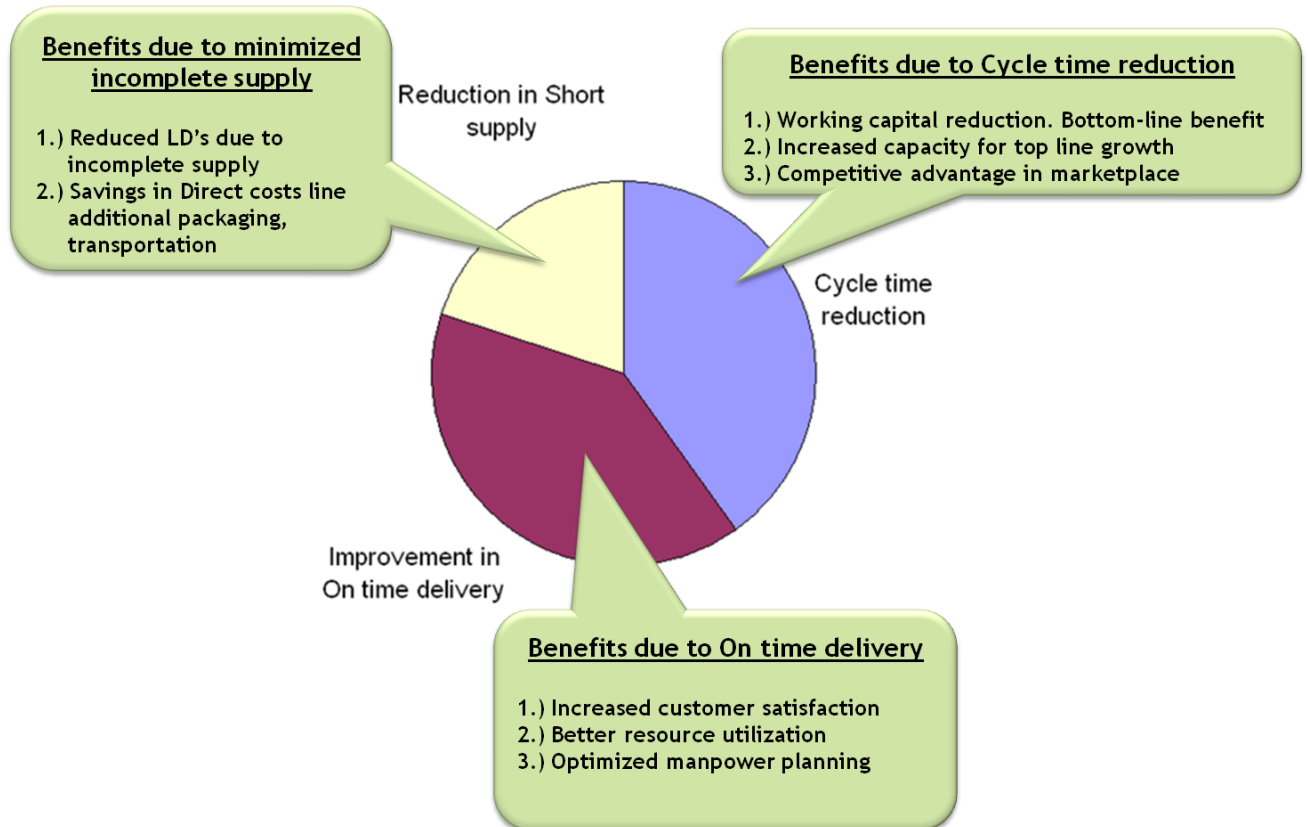


Fig 5: The consultative approach adopted and applied by L&T Infotech

## Benefits

With properly analyzed and proactively initiated planning, manufacturers can realize sourcing benefits in various areas as described in the following illustration:



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## Conclusion

Project based organization like Capital equipment, Heavy machinery & Construction / Off-highway equipment manufacturers, Aerospace companies, Ship builders etc. operate within Engineer-to-Order / Configure-to-Order scenarios & have typically higher “buy” content in “make-buy” mix. This forces them to critically evaluate alignment of sourcing of “long lead buy parts” to “overall project time lines” as part of their sourcing strategies. The implementation of the advanced sourcing planning and risk mitigation framework allows manufacturers to make informed decisions on when to initiate sourcing of “long lead buy parts”. Such sourcing decisions rooted in a strong risk mitigation strategy, will reduce the schedule variance contributed by long lead items thereby will reduce contractually obligated LDs \penalties

## Abbreviations and Acronyms

ATO	Assemble to order
ETO	Engineer to order
CTO	Configure to order
MTO	Make to order
BoM	Bill of Material
LD	<p>Liquidity damages: These are penalties in monetary terms imposed on ETO supplier by its customer in the event of Project delays.</p> <p>Such penalties are defined upfront in techno-commercial contracts &amp; are generally defined as % age of contract value which ETO supplier has to pay / credit back to customer in case of such delays</p>

## References

Supply chain Council	<a href="http://supply-chain.org/">http://supply-chain.org/</a>
APICS-Association for Operations Management	<a href="http://www.apics.org">www.apics.org</a>
SAP - Supplier Relationship management (SRM) suite of solutions	<a href="http://www.sap.com">www.sap.com</a>
Ariba- Procurement management suite of solutions	<a href="http://www.ariba.com">www.ariba.com</a>

## About the Author



**Sachin Kulkarni** leads Manufacturing industry solutions group at Larsen & Toubro Infotech Ltd. He has over 15 years of industry and consulting experience in New Product Development and Supply Chain Management domains. He has worked in India, North America, Europe and South East Asia in Automotive and Industrial product companies. Sachin has a BE in Mechanical Engineering with a MBA in Marketing. In addition to this, he is a Certified Supply Chain Professional (CSCP) from American Production & Inventory Control (APICS) and Qualified Project Management Professional (QPMP)

## About L&T Infotech

Larsen & Toubro Infotech (L&T Infotech), one of the fastest growing IT Services companies, is a part of USD 11.7 billion L&T Group, India's 'Best Managed Company' with presence in the areas of engineering, manufacturing and financial services. It is ranked by NASSCOM as 8th largest Indian software & services exporter from India, is amongst NASSCOM's Top 20 IT-BPO Employers in India (FY2009-10) and is ranked 7th in DATAQUEST-IDC top 20 IT Best Employers Survey 2010. L&T Infotech is differentiated by its unique Business-to-IT Connect, which is a result of its rich corporate heritage.

It offers comprehensive, end-to-end software solutions and services in the following industry verticals: Banking & Financial Services; Insurance; Energy & Petrochemicals; Manufacturing (Consumer Packaged Goods/Retail, High-tech, Industrial Products, Automotive), and Product Engineering Services (Telecom).

The Company's new emerging verticals include Media & Entertainment and Life sciences & Healthcare. L&T Infotech also delivers business solutions to clients in the following horizontals/Service Lines: SAP, Oracle, Infrastructure Management Services, Testing, Consulting and Business Process Services; while its other service offerings are: Business Intelligence/Data Warehousing, Legacy Modernization, Applications Outsourcing, Architecture Consulting, Enterprise Integration, Service Oriented Architecture, Systems Integration and PLM.

L&T Infotech also offers Unitrax®; a SaaS-based transfer agency product, enabling fund managers to process product types such as mutual funds, fixed income, structured notes, annuities, segregated and retail venture funds. Unitrax® provides web-based BI reporting, sales analytics and CRM features. Unitrax®'s Web services-based architecture eases inter-connectivity to in-house applications. With a consistent high client satisfaction measure, the product improves efficiencies through streamlined and automated client processing and administrative features whilst ensuring a high level of compliance with regulatory requirements and industry standards.

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