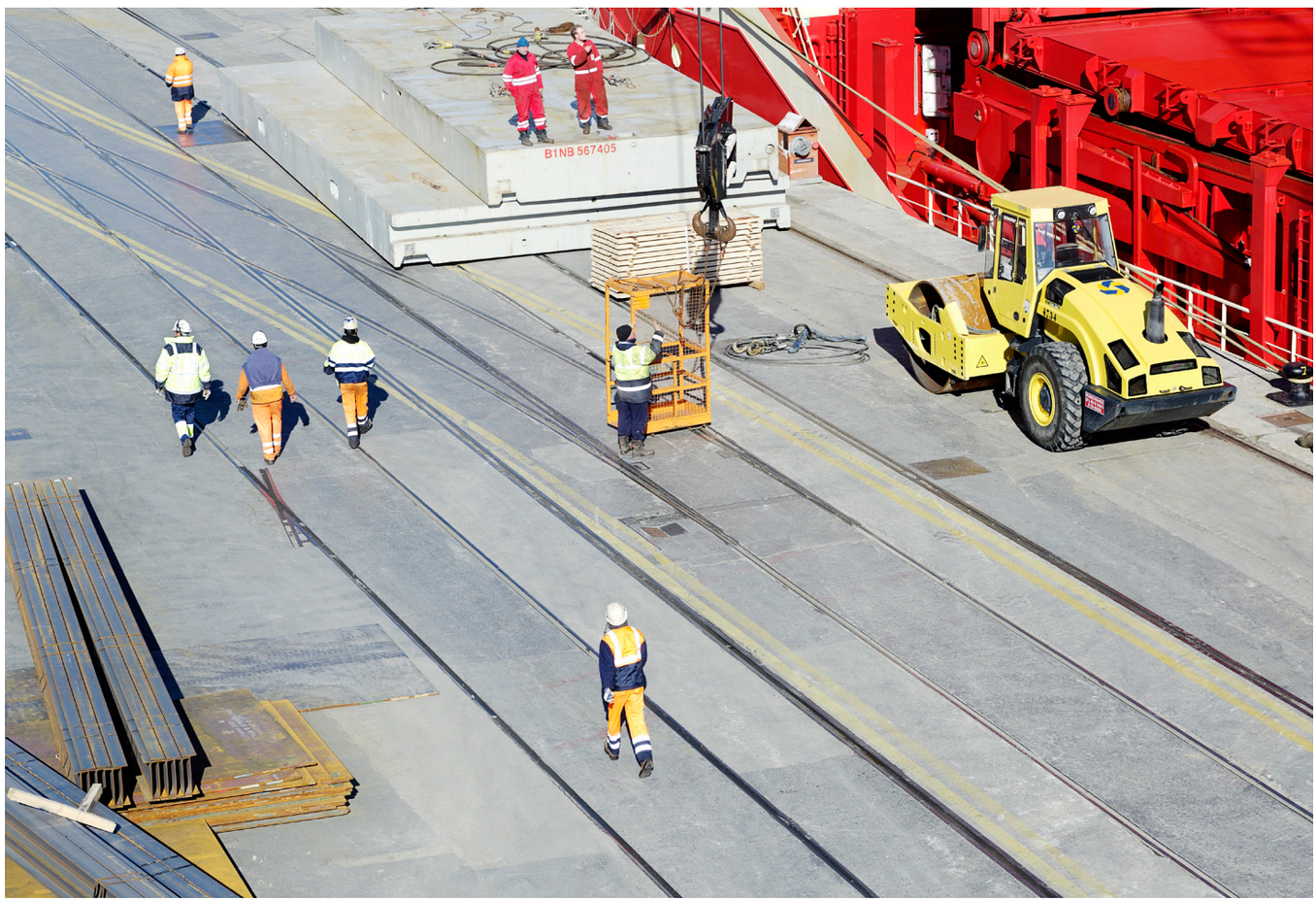
Confederation of Indian Industry

Leveraging IT

Transforming the T&L sector



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In recent years, great emphasis has been laid on enhancing the supply chain efficiency on road as well as off road. The government has also taken key initiatives to support the transportation and logistics sector in order to ensure that this sector contributes to the growth of the economy.

Before investing in the country, foreign investors assess the infrastructure, most importantly the transportation and logistics sector. In addition, the user community of the sector has expectations from service providers in terms of order management, material handling, real-time tracking and tracing, automated workflow based documentation, warehousing, material delivery and the electronic payment facility by service providers.

PwC believes that IT has a big role to play in improving the efficiency of the supply chain and also meeting the ever-rising expectations of the user community. Though the penetration of IT in the Indian transportation and logistics sector has been quite low, there are huge opportunities to leverage it for the benefit of not only the logistics companies but also the consumer.

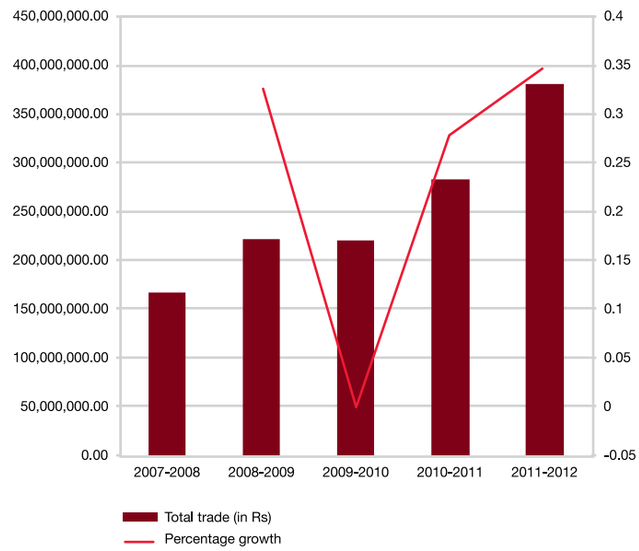
In an increasingly technology-driven environment, transportation and logistics companies need to adopt technology solutions that not only align themselves to the organisation's business needs but also help them achieve growth and efficiencies. To achieve competitive advantage, these companies need to leverage emerging technologies and best practices. They also need to adopt innovative ways of analysing data and tracking business performance parameters. It is important to manage organisational changes to create a culture that motivates employees during the implementation of these technologies.

PwC as a knowledge partner with CII is proud to publish this thought leadership.

Rachna Nath
Executive Director
IT Effectiveness

Indian transportation and logistics (T&L)
An overview

The Indian logistics market has evolved from traditional transport companies to a full-fledged logistics service provider, offering various supply chain services such as transportation, warehousing and other value additions.



In comparison to other developing and developed countries, Indian logistics competitiveness has been low primarily due to the following:

- *Poor infrastructure*
- *Low technology penetration*
- *Low regulatory effectiveness*
- *Fragmented industry participation*

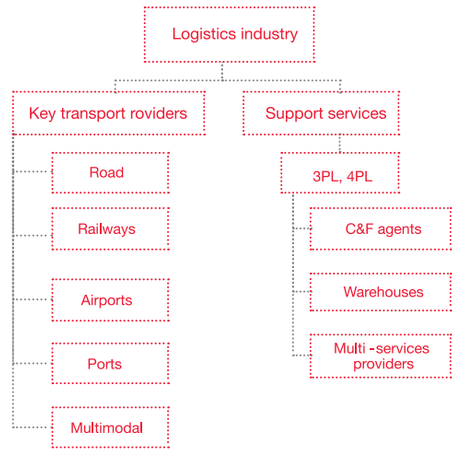
The growth in T&L is primarily dependent on the growth of goods across different sectors within the country and goods traded with other countries. The figure shown above provides the total trade in rupee terms over the last five years. As such, the index of industrial production (IIP) is a good indicator of the level of domestic industrial activity. India's manufacturing sector supported by a consuming population of more than one billion has shown robust growth over the past decade.

The logistics performance index ranking provided by the World Bank ranks India 46th among 155 countries . The main indicators of the LPI are the efficiency of the clearance process (speed, simplicity and predictability of formalities) by border-control agencies, including customs, the quality of trade- and transport-related infrastructure (ports, railroads, roads, information technology), the ease of arranging competitively, priced shipments, the competence and quality of logistics, services (transport operators, customs, brokers) and the ability to track and trace consignments. India ranks behind China at rank 1 and Brazil at rank 45 among the BRIC group.

There is a long way to be covered by this sector to reach global standards which would include excellent infrastructure and highly technology driven seamlessly integrated supply chain.

Logistics service providers

PwC views the logistics industry in two verticals where one vertical provides transportation solutions through various modes and the other provides complete supply chain solutioning with facilities like 3 PL, inventory management, and other value-added services.



Road transport has emerged as the dominant segment in India's transportation sector with a share of around 5% in India's GDP in comparison to railways which has around 1% share in the GDP in 2010-11 . Easy accessibility, flexibility of operations, door-to-door service and reliability have earned road transport an increasingly higher share of both passenger and freight traffic vis-à-vis other transport modes .

The 3 PL market which demonstrates the consolidation and advancement of logistics players in terms of breadth of service is still nascent in India. It makes up for more than 50% of the logistics market in developed markets, but is still at a growing stage in India . Today, Indian 3 PL service companies often do not possess sufficient capabilities to provide services beyond conventional transportation contracts. Many are not able to respond to the increasing demand for value-added services such as customs clearance, cross docking, reverse logistics, labelling or packaging.

Sector challenges

- A road carrier has to stop at numerous locations for the physical verification of documents. The checks are essentially made to ensure that taxes in the state of destination have been paid, trucks are not overloaded, comply with safety stipulations and carry valid papers. This issue is more amplified by the presence of segregated sales tax administration, multiple laws and a manual and segregated vehicle registration system.
- T&L and in particular warehousing, is a capital-intensive sector characterised by low margins. This has its effect in the expansion plans of the numerous logistics players.
- There is acute shortage of trained manpower in the T&L sector. The present workforce does not have the requisite skills to handle the entire supply chain and training of personnel will be key to the success of players.

- The unorganised nature of the industry (especially in road transport) and skill shortage has further led to non-standardised operating procedures with its inherent inefficiency.
- Paucity of funds discourages operators from investing in technological upgradation of vehicles, including adopting energy efficiency standards as well as IT tools like vehicle and consignment tracking using Global Positioning System (GPS) and Radio Frequency Identification (RFID) technologies.

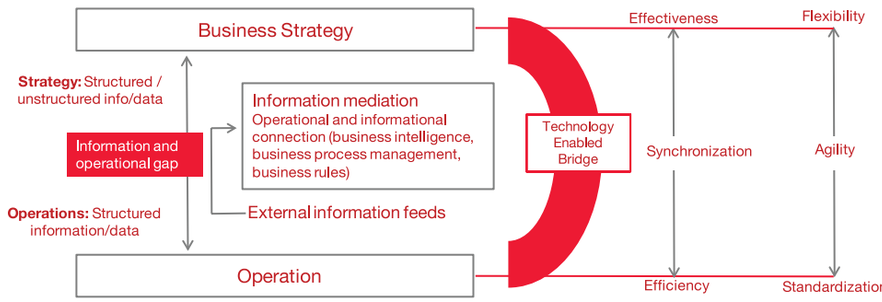
T&L is mired with many such issues and overcoming these is key for its next stage. Technology has the potential to solve some of these challenges and help the sector leapfrog.

Technology and business

Technology adoption is driven by two primary factors--increasing internal efficiency which is the operational aspect and increasing external business responsiveness dependent on a complete supply chain based on business strategy and long term planning.

Technology can bridge the business vision with real-time operational activities of business. It can help enable the following:

- Synchronisation, thus increasing the effectiveness of strategic decisions and improving the efficiency of operations
- Agility, which helps increase flexibility with strategic decision-making and standardisation of operational applications



Source: PwC Technology Forecast

IT interventions in the sector

Technology in the logistics and supply chain industry is a blend of delivering global business solutions to local geographies. With businesses crisscrossing across private and public houses, the user community of the sector perceives this business as a combination of infrastructure and operations where technology plays the role of glue.

We believe that organisations have started looking at the transportation and logistics function as critical and differentiating rather than a business-enabling or support function. While the larger players with deep pockets have made steady inroads in investment in this function, the smaller, family or proprietor-driven firms as in India are yet to make significant investment around technology and talent in this function.

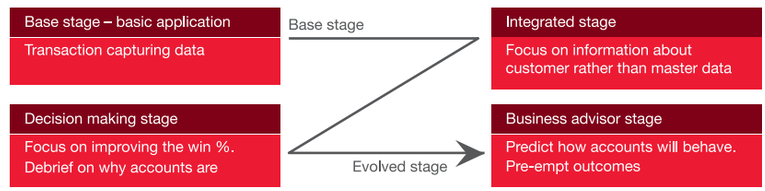
Given the global challenges, rising fuel prices and the constant demand for near-perfect delivery, the role of information and how it can assist a leaner and smarter logistics function has never been more important than now.

Therefore, what should be the role of the CIO in the logistics and supply chain industry?

We view this role in three dimensions:

- **Accelerate** the efforts to help optimise operations and improve customer connect
- **Adapt** emerging technologies to drive continuity and costs
- **Action** the people agenda

In order to make the transition from the current state to the desired state, transportation and logistics organisations will go through the following stages of evolution on the technology roadmap.



Increase in IT adoption has provided a boost to the growth and maturity of logistics players in India wherever it is not only implemented but also institutionalised in daily activities. India's T&L technology market is growing steadily, with the upswing in demand from the thriving logistics, retail, pharma, agri and manufacturing sectors, as well as through government promotion.

The growth of India as a major sourcing nation for the world's leading retailers is also ramping up demand for appropriate information technology intervention. This ensures seamless flow of information across the complete supply chain and also provide relevant data for business analytics.

Some of the other key benefits observed with IT intrusion are detailed in below section. These benefits have driven the companies to implement relevant IT in their organisation are reaping the fruits with IT as differentiator in their sustainable growth plan.

Benefits of IT interventions

IT plays multiple roles in the Indian logistics sector. However, its primary objective is to enforce and cleanse internal hygiene and manage operations with increased efficiency. IT also plays conventional roles such as increasing productivity and standardisation of information management.

Other key benefits of IT as envisaged by the CIO of the T&L companies are as follows:

- Increasing customer account management, relationship and accessibility
- Integration of off-road and on-road movement of consignment and vehicle
- Real-time tracking and tracing of consignment and vehicles off-road and on-road
- Standardisation of processes and improving process efficiency
- Reducing labour costs and handling fuel and sales management costs
- Increasing transparency and accountability within the organisation
- Quick response and access of information

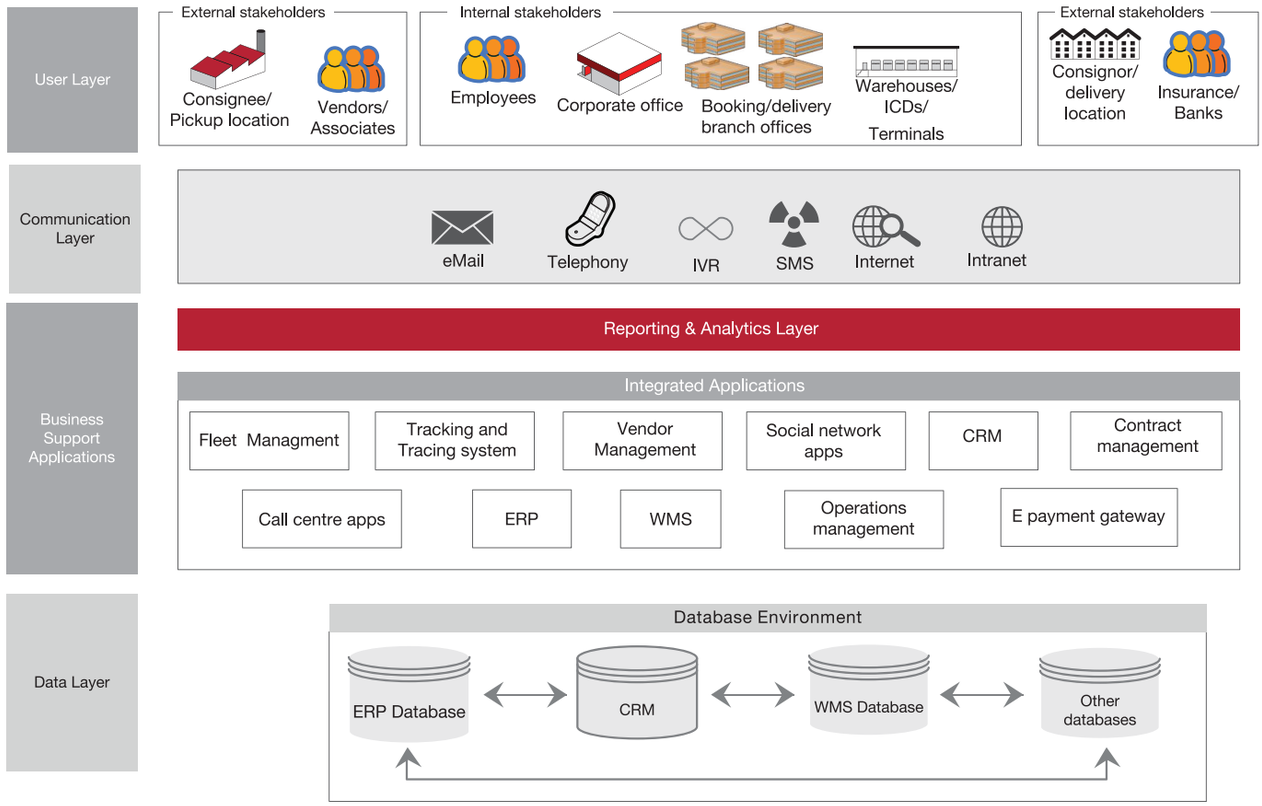
Key IT interventions

We understand that to optimise operations and improve customer interactions , IT needs to focus on some of the following aspects :

- Making systems flexible to allow implementation of business transformation easier
- Increasing the efficiency of key value points across the supply chain to reduce costs and delays
- Integration of key stakeholders in the value chain so that information can be consolidated and shared across the value chain for better visibility and execution

With this view, PwC suggests the indicative target operating model for cargo transportation and logistics company as shown below. It maps key users, communication mechanism, and the widely used and accepted technologies by the industry in order to achieve the objectives defined above.

Indicative IT target operating model for cargo transportation and logistics companies



Enterprise resource planning (ERP): PwC considers ERP as a hygiene factor. ERP not only integrates the corporate and business functions of an organisation enabling them to communicate and share information, but also provides great opportunities to the companies to redefine their internal processes with global best practices.

Warehouse management system (WMS): This is an end-to-end solution for warehouse management that links different systems such as computerised vehicle routing, scheduling packages and integrated supply chain systems to monitor incoming goods, customer orders and stock levels. Efficient storage and movement of goods can be accomplished by such a system. The implementation of this system depends on the number of integration points, size and complexity of the supply chain.

The need for WMS is completely dependent on the complexity (in terms of size and volume) of warehousing operations and throughput efficiency (in terms of operational productivity):

- For service providers with small warehouses in cities or towns that cater to local distributors and suppliers, traditional ways of managing operations and tracking inventory is preferable.

- For service providers operating at a regional level, who have significantly large operations with considerable volumes mini WMS solutions are available that are good in managing inbound and outbound operations. They also help manage and track inventory levels. Organisations using various ERPs can also extend their ERP systems and use a WMS module that will help resolve integration challenges. Such solutions can be customised and are also easy on the pocket.

RFID: Tracking and tracing vehicles, consignments, containers and other equipment at all locations i.e, on or off road is very important for transportation and logistics companies. The people who use their services have also started demanding real time tracking of the movement of their consignments. The radio frequency identification devices (RFID) address this need. For timely delivery of consignments, RFID along with vehicle tracking systems track the location of vehicles. These RFID readers and tracking devices can be integrated with ERP and WMS as required. NHAI and the ministry of road transport and highways are also working in this direction to manage toll collections with the implementation of RFID to ensure faster movement of vehicles at toll gates.

Fleet management system: This is being slowly accepted by the transporters for managing their fleet of vehicles and other material handling devices including cranes. Such systems help the companies track and control the maintenance cost of their vehicles and equipment. Some of the companies have initiated building profit and loss sheets per vehicle using this system. These systems can also be integrated with ERP and RFID systems for seamless flow of information.

Scheduling systems: Manual vehicle planning and routing has been a challenge for transport companies. Few companies have implemented computerised vehicle and scheduling systems with complete data pertaining to consignee and consignor. This has resulted in the accurate and efficient scheduling along with better vehicle utilisation on road. It is observed that this automated routing has tremendously increased the service delivery efficiency resulting in higher customer satisfaction.

Few of the other technologies useful for transportation and logistics companies are as follows:

- Hand held devices for managing proof of delivery
- Satellite navigation systems to accurately locate the consignee or consignor locations
- Scanners and other security devices

All these technologies can be integrated with ERP and other IT applications for managing their core operations.

Key barriers to IT adoption

This sector is generally perceived to be reluctant in investing in IT. Several factors like the unorganised and fragmented nature of the sector, lack of regulatory compulsions and the view of the business leaders on IT as an expense rather than an investment are said to have contributed to the low penetration of IT in this sector.

Some of the other factors that act as barriers to smooth IT adoption in transportation and logistics sector are as follows:

- **Unavailability of a perfect fit system:** The transportation and logistics operations are quite complex and needs specific functionalities in the IT systems. Fitment of an off the shelf product that satisfies the end-to-end needs of this sector is still questionable. Base ERP products, available in the market require high levels of customisation and implementation time, thereby increasing costs.
- **Technology costs and affordability:** The transportation and logistics industry has perceived technology and solutions as expensive and at times unaffordable. Since the companies have evolved with their unique legacy processes, their IT system or applications need to be customised to the company's requirements. This results in tremendous increase in end product cost.
- **Low allocation to IT in the budget:** Most warehousing firms do not have a formal IT budgeting process and hence don't plan for their IT investments. Majority of the logistics market comprises small and medium-scale players who due to increased competition in the sector work on wafer thin margins. This results in little or no allocation to IT in their budgets.
- **Limited IT benefits perceived:** Most logistics firms are managed by small entrepreneurs who do not have a good understanding of IT and its benefits.
- **Restricted support from end customers:** Transportation and logistics companies have been wary of the fact though their customers desire real time information, online tracking of consignment and faster resolution of their grievances with IT intervention / e-ticketing systems, they are unwilling to pay for these investments in IT. Players find it difficult to manage these expectations and maintain costs, resulting in their reluctance to spend in IT.
- **Skilled resources:** This sector in India lacks skilled talent that has IT and logistics knowledge.These resources are required to run and maintain the application so that the intended benefits that the application provides can be realised. Very few logistics sector employees undergo IT training during the course of their employment.
- **Standard business processes:** Standardised business processes are not defined across all internal and external functions. This causes high levels of individual customisation in systems. Transformation of such business processes becomes difficult because the systems are not flexible enough to incorporate the changes within a reasonable time and cost.
- **Cultural barriers:** Traditionally transportation and logistics businesses have been operated by unskilled or semi-skilled resources. This makes it difficult for the employees to accept change and transform their organisation through IT intrusion.

There are several transportation and logistics companies in India who have invested in excess of 0.8% (as an average percentage of the capex) into IT but even they are facing several challenges. Key among them is that they are unable to capitalise on their IT initiatives to maximise business opportunities. However, we believe that these challenges are different when the organisations moves up to the maturity curve.

Some of the reasons for challenges are as follows:

- The IT department is usually headed by a non-IT resource and the IT manager is seen only as a procurer and supplier of IT goods/ services.
- There is rarely any long term IT vision and roadmap in transportation and logistics companies. Mostly the implementation of IT is sporadic and need based leading to stack of standalone applications/ systems creating silos.
- Inability to measure the success and utilisation of current or envisaged IT systems.
- Ever changing business processes and business requirements
- Indecisiveness to invest further in major IT initiatives as it is not the priority of the management
- Business processes partially continue to be manual, while some are upgraded to the IT system
- Unwillingness to discard current systems and move to new ones.
- Ongoing decisions required during implementation are not taken seriously
- Inadequate internal stakeholders expectations and change management

PwC is of the view that for the transport and logistics industry to benefit from IT, this function needs to have a systematic organisational structure and the roles and accountabilities need to be redefined. We believe organisations need to recognise the fact that the roles of the chief information officer (CIO) and the head of technology are fast evolving . If the CIO or the head of technology has to make IT relevant and a key prominent of business change,then he/she has to constantly innovate and drive the experiential delivery aspect. This must be done irrespective of whether the customer is internal or external.

CIOs and technology heads need to start focusing on benefit management more than programme management during and after the IT implementation. Adopting new age technology has to be a part of the daily routine. Given the margin pressures of this industry, every penny will be questioned. This makes it imperative for the CIOs and CTOs to have the list of non-negotiable and relevant technology interventions for stakeholder expectation management.

Key initiatives undertaken by the government

People continuously expect the logistics service providers to provide world class delivery services. This propels the companies to rely more on IT for efficient and smooth flow of their consignments. PwC believes that government policies and initiative could also prove to be a catalyst in the faster penetration of IT in transportation and logistics companies. The government is also sensitive of this fact and has been working directly and indirectly in this direction. Some of the interesting initiatives taken by government are as follows:

Implementation of freight operation information systems (FOIS): This is a computer network based information system that has been designed to give strategic advantages to both Indian railways and its customers. The network links various freight handling points, traffic control and rolling stock maintenance depots with the railways administration. FOIS will provide continuous cargo visibility and enable freight customers to have instant access to information regarding the current status of their consignments in transit and the expected time of arrival at its destination. This will help the industrial customers to achieve just-in-time inventory levels. Once it is fully implemented, FOIS will facilitate acceptance of customers' orders for wagons and rakes (full length train formations), billing of freight charges by the railways and its payment by the customer electronically, and along with the introduction of e-commerce will make the entire business chain seamless. FOIS consists of two fully computerised modules, namely rake management system for handling the freight movement portion and terminal management system (TMS) for managing the commercial transactions with the customers.

Implementation of electronic toll collection on India's highway network to ease delays and traffic congestion at toll collection points: The ETC system would enable a smoother thoroughfare of traffic at toll plazas by facilitating automatic vehicle identification (AVI) and electronic collection of toll. As per CRISIL Research, currently, there are close to 525 toll plazas, operating on national and state highways in India. Over 20,000 vehicles cross these plazas daily, each queuing up for approximately 5-10 minutes awaiting their turn to pay the toll fare. Each vehicle consumes almost 0.5-1.0 litre of fuel in an hour. Collectively, these vehicles spend around 1,800-3,600 hours at toll plazas.

Leveraging emerging technologies

Gains in operational efficiency can be credited to a more expansive use of IT that helps businesss run faster and more effectively. We believe that adapting emerging technologies to drive low cost and create scalable and flexible systems will be key to the overall success of the IT function.

Few companies outside the pure web space have become truly digital in which information and the ability to act on it creates significant economic and competitive value. Leading companies are capitalising on digital ecosystems that are expanding due to the confluence of social networks, mobile computing, analytics, and cloud computing (SMAC). SMAC challenges enterprises to take advantage of the positive disruptions it portends, while they operate at the rapid pace of innovation and change that demands.

SMAC and other emerging technologies create the possibility for new ways to develop products, interact with customers, partner with others, compete and succeed.

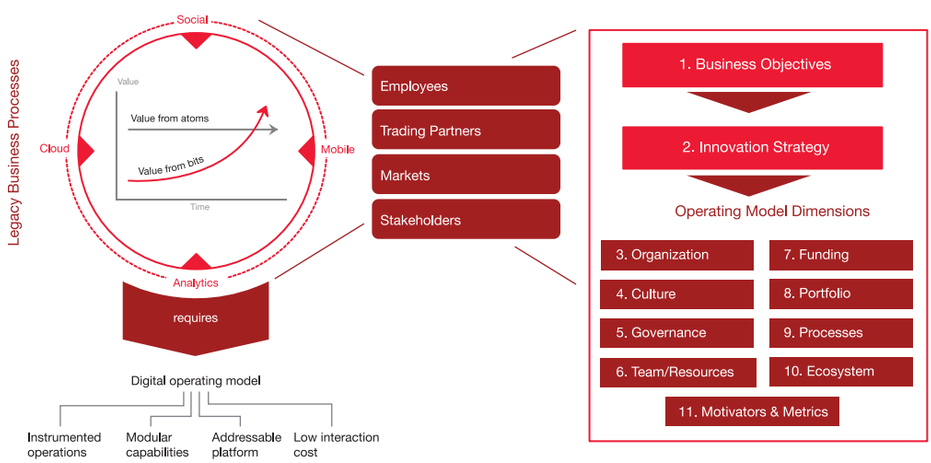
More than strategy for any individual technology trend or for combining more than one of them, companies needs a systematic approach to engage with these technologies. Companies that have the most success engaging with SMAC are rethinking their business and enterprise architectures and emphasising three fundamental changes.

- They acknowledge that SMAC trends are the strongest signal yet that business ecosystems are becoming more digitised, where information content accounts for a rising proportion of the entire value of any product or service.
- They understand that successfully tapping the new drivers of value requires a digital operating model, a model attuned to participating in or integrating with expanding digital ecosystems.
- Successful companies are adjusting their business and enterprise architectures to allow easy digital connections.

The confluence of SMAC trends is driving this shift in business value.

PwC anticipates that information associated logistics services will increasingly account for a rising share in the customer's experience of value delivered, as illustrated below.

Customer's experience of value delivered



Scaling integrations requires a digital operating model

While each SMAC technology has its own unique impact, the technologies are complementary in support of work getting done.

The cloud increasingly contains more of the information and applications that people use.

Mobile devices give people access to the cloud, to other data sources, and to each other. It empowers the authorized users to be more efficient with data on his finger tips

Analytics help them make actionable sense of all that data.

Social media helps people find colleagues / service providers with whom to collaborate and co-create.

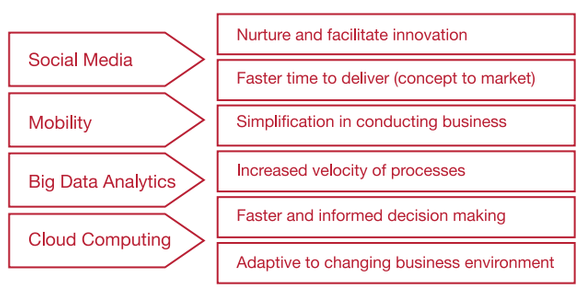
The collective impact of SMAC on the enterprise operating model is so broad that it helps to think about the SMAC technologies as an integrated whole from a strategic viewpoint as illustrated below.

Strategic view point of SMAC

Trends	*Relationship with work*
Social	*Who we work with*
Mobile	*How we get to work*
Analytics	*What we work on, the meaning of work*
Cloud	*Where we do the work*

Emerging technology embarked on a journey to adopt high-quality innovative IT and business process improvement solutions

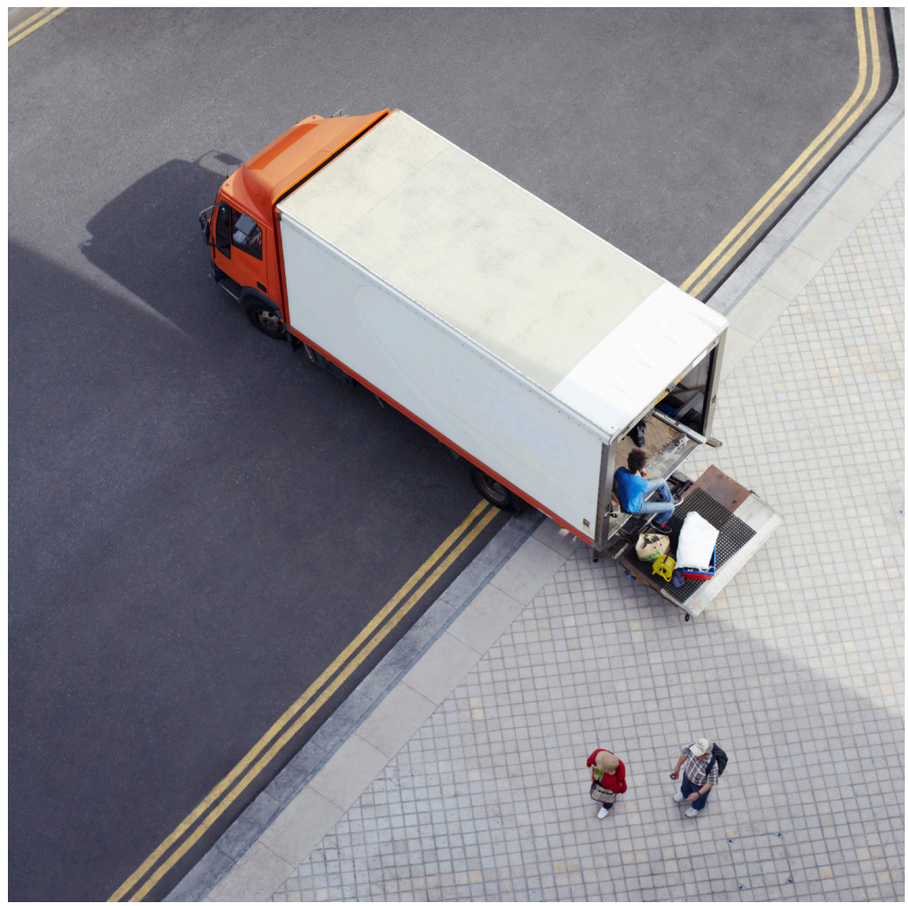
Emerging trends and business process improvement



We recognize that SMAC is very relevant to the transport and logistics sector and many of the challenges pertaining to IT barriers could be addressed with the adaption of these technologies. Few of the transportation and logistics companies have effectively initiated hosting of sales and contract related workflow based application on cloud. This has helped them reduce cost on application and infrastructure heads.

On similar lines, mobility solutions could be used for managing the delivery status through SMS and could add value if integrated with automated hand held devices for POD management. Invoice management, payment outstanding and collection reconciliation are general challenges which could be addressed with these mobility solutions if integrated with ERP or other related IT applications.

We also believe that social media could be a game changer for the organisations providing complete supply chain solutions to their end customers. With e-commerce emerging as a strong marketplace, the supply chain solution providers would need to stay engaged with end users online through social media. This medium would be an effective mechanism to gather relevant feedback and also emerge as a strong branding agent. Though the direct clients of transportation and logistics companies have started building strategies around using social media technology, it is yet to take any concrete step towards an effective usage of this platform.



Notes

About CII

To address the need of sharpening India Inc's competitive edge through better Logistics and Supply Chain practices, CII Institute of Logistics (CIL) was established in 2004 by the Confederation of Indian Industry as a Center of Excellence in Logistics and Supply Chain.

At CII Institute of Logistics we create a platform for the Industry to gain more insights into the emerging trends, industry specific problems of national importance and global best practices in logistics & supply chain management. We enable the industry to cut down the transaction cost, increase efficiency, and enhance profitability and enable to sensitize and bring solutions to macro level issues.

The Vision
CII Institute of Logistics to become an International Centre of Excellence in Logistics and SCM and to facilitate Indian industry to be referred in Global Business for its Best Practices in SCM and Logistics.

The Mission
CII Institute of Logistics to be a platform to create and share intellectual capital for reducing transaction cost and improving competitiveness, in the process nurture the skills of Logisticians and ensure adoption of Best Practices in Logistics and SCM through online and offline activities.

For over four years now, CII Institute of Logistics, the country's premier Centre of Excellence in logistics and SCM, has enabled a number of exemplary success stories in logistics.

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PwC* helps organisations and individuals create the value they're looking for. We're a network of firms in 158 countries with more than 180,000 people who are committed to delivering quality in assurance, tax and advisory services.

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*PwC refers to PwC India and may sometimes refer to the PwC network. Each member firm is a separate legal entity. Please see www.pwc.com/structure for further details.

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