Container Supply Chain Visibility

An INTRACK Publication

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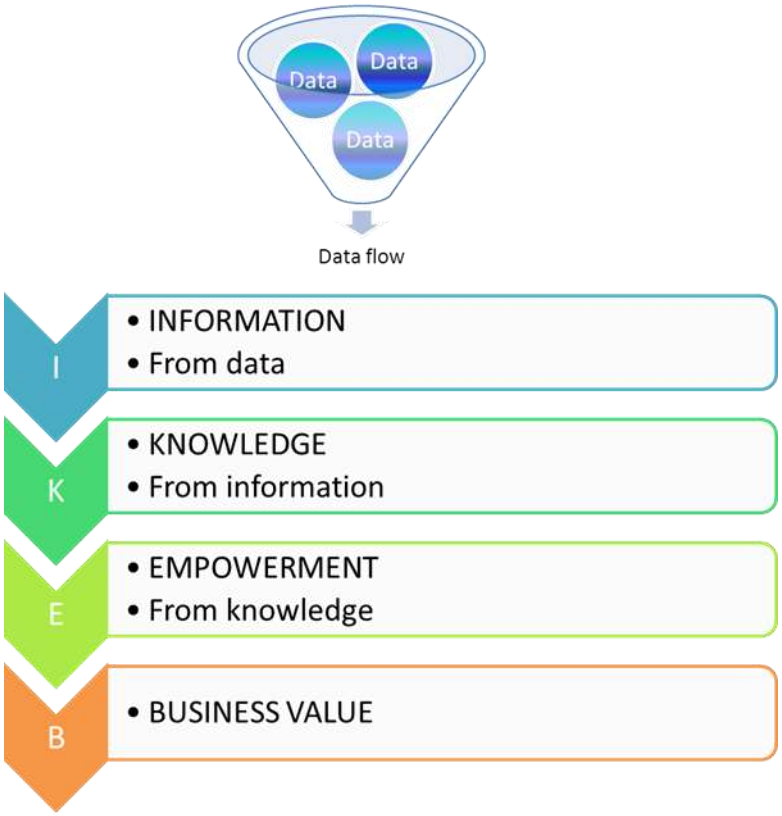
Outline of Industry Issues

Current state-of-the-art logistics door-to-door chains still show a lack of information flows preventing the provision of high efficient and reliable services. Information / visibility platforms that are meant to enable management decision making still contain many 'blind-spots' that result in business 'spillage' throughout the supply chain.

This fundamental issue is widely recognized as a major obstacle to efficient supply chain logistics. Recently an EU funded multi-million pound project 'Integrity'[i] brought together experts from The Institute of Shipping Economics & Logistics[ii], RSM Erasmus University[iii] and the Cross-border Research Association[iv] to analyse and then create solutions for visibility within the container supply chain.

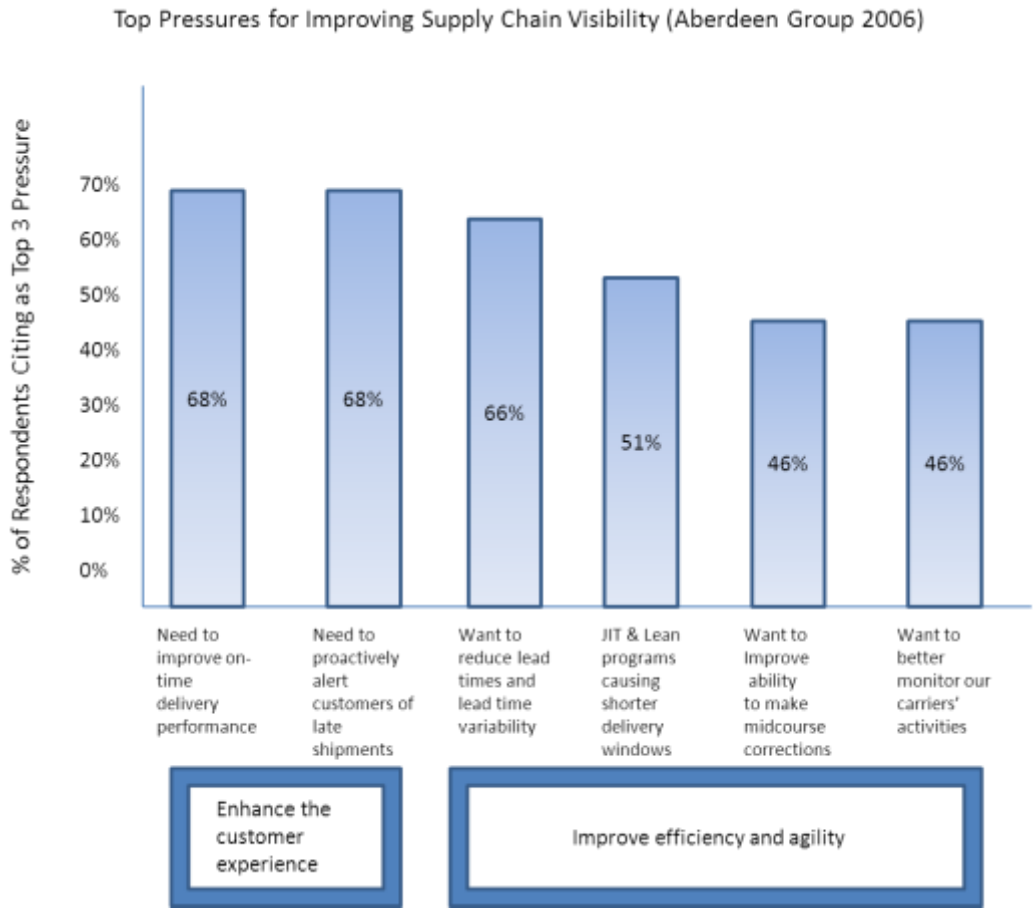
The Integrity Report found (pp132) that the strong growth in container transport has created complex logistic chains consisting of many actors resulting in 'information gaps' that are challenges that need to be managed by the industry.

Logistical Software develop solutions that integrate data flows from different actors, validate the data collected, filter the stream into deliverable information and enable management to fill in these information gaps. These solutions give additional business value by providing visibility across the supply chain.



Research

The Aberdeen Group[v] in their 2006 white paper 'The Supply Chain Visibility Roadmap'[vi] featured case studies from retailers, manufacturers, and distributors and a step-by-step guide on how to improve visibility to orders, shipments, and inventory. They found that Supply chain executives identify improving visibility as their number one priority. The top pressures for improving supply chain visibility where listed as follows:-



They found "79% of large enterprises point to a lack of critical supply chain process visibility as their top concern for managing their global supply chain operations. Because global supply chains are inherently complex, multi-party processes with high degrees of uncertainty, visibility technology is essential to moving to a more productive, exception-based management practice."[vii]

Additionally The White Paper from the industry funded supply chain security and efficiency initiative "Smart & Secure Trade lanes"[viii] listed the following problems and challenges:

• Supply chain data is missing or inaccurate, untimely or incomplete making it of little value for decision making
• Arrival notices appear days after the arrival
• Containers deviate from their assigned routing.

Companies seeking more efficient processes are demanding higher transparency within orders status, inventory, and shipments across their extended supply chain. In the supply chain, visibility is a precondition to adequately manage events. According to INTEGRITY findings[ix], there are three main obstacles to achieve visibility:

- Organisational: it is difficult to address the responsibility for visibility since it transcends different organisational functions and regional boundaries that all benefit from improved visibility.
- Technology: Visibility systems have to gather information from multiple internal and external systems; that requires many interfaces to other systems. However, web services, B2B hubs, and transportation carrier portals are now making interfaces more manageable.
- Managing visibility information: how to drive strategic business improvement from visibility information. Additional technology and organizational capabilities are needed to achieve this. Companies need a system which can monitor the events in the entire supply chain and that provides reports to all stakeholders involved.

The Aberdeen Group[x] reasoned that according to the background and the related problems in supply chain visibility the following performance benefits can be achieved:

- "Inventory reductions: Companies that are 'Best in Class' in inventory management are 2.4 times as likely to use a supply chain visibility system. These top performers have customer service levels of at least 96% and have reduced inventory levels since 2004, often by 20-30%
- Cycle times: Companies using a visibility system are three times as likely to have faster order to delivery times as those companies that have no plans to adopt such a solution.
- On-Time Deliveries: Companies that track more than 80% of their domestic shipments are twice as likely as their peers to have an on-time delivery rate of 95% or higher.
- Management by exception delivers effective shipment tracking, Supply Chain disruption management and Supply chain improvement.

Solutions to these problems enhance business value through:-

Shipment Tracking: Systems that provide shipment tracking answer the question of "where is my stuff." Effective shipment tracking improves customer satisfaction and helps internal operations plan better for incoming workload

Supply Chain Disruption Management: Disruption management adds the ability to alert users proactively if shipments are deviating from planned milestones (e.g., shipments are early or late or incomplete), provide escalation workflow, and assist in problem resolution.

Supply Chain Improvement: The greatest financial value comes from using visibility information to identify and eliminate root causes of delays. This requires statistical analysis and pattern recognition. Effective supply chain improvement reduces lead times and variability, enables lower inventory investment, and cuts freight costs.

Because of the importance of applying visibility to supply chain activity, almost all companies that have been included in independent research have signified a clear intent to embark on enhancements to their current processes to enable more effective decision making

TOP 10 Planned Enhancements	% Respondents Planning to Enhance
1. **Expand Number** of trading partners providing status information	54%
2. Incorporate **additional status events**	50%
3. Track **actual total landed cost** as shipment/order progresses	45%
4. Incorporate **resolution advice** or workflow (e.g., expedite advice)	45%
5. Add financial settlement or **financial triggers**	45%
6. Add **warning alerts** if actual events deviate from plan	44%
7. Add **RFID-enabled** visibility	43%
8. Add **escalation policies** to help manage alerts	43%
9. Performance trending and **root cause analysis**	42%
10. Add visibility into **mobile assets** (e.g., containers, equipment)	41%

Source Aberdeen Group November 2006 (p7)

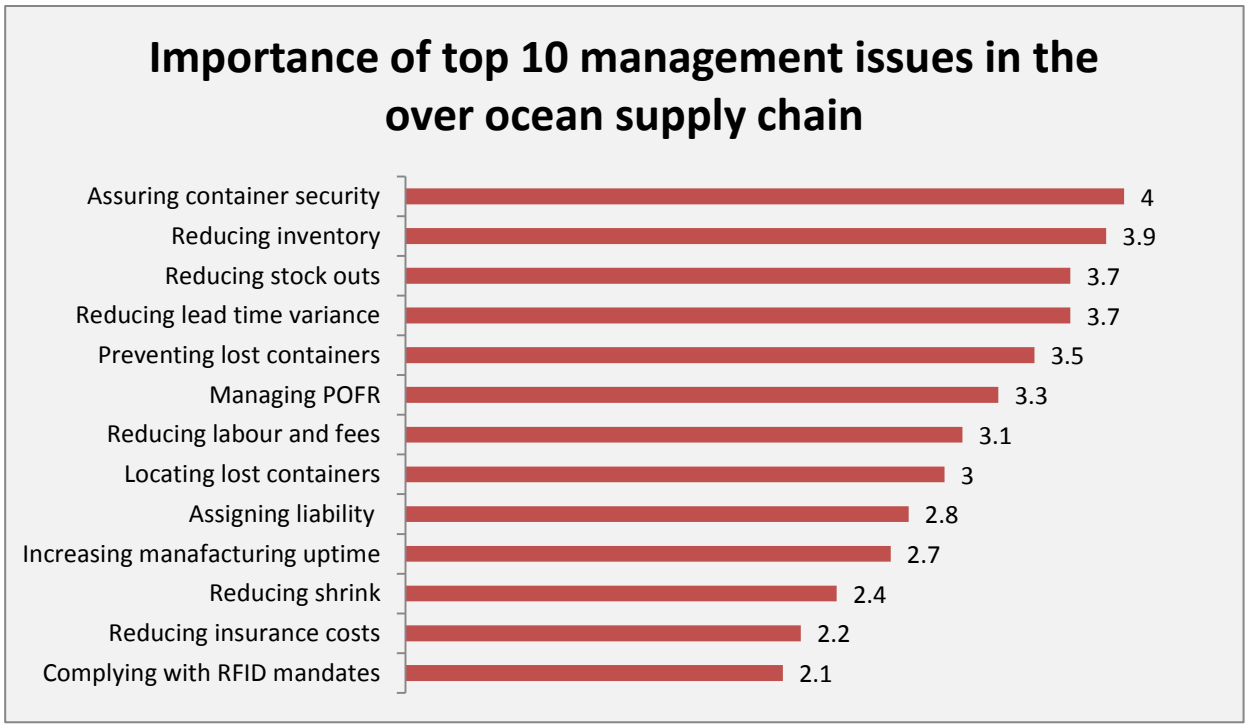
Companies are planning similar enhancements in their domestic visibility programs. The next table shows the Top 10 visibility improvements planned by respondents. Note the high percentage of firms wishing to calculate future inventory positions and new estimated times of arrival (ETAs), as well as improve issue escalation and resolution processes.

Enhancement	Have today	Plan to add In next 2 years	Interested but no formal plan	Total Interest Level
1. **Warning alerts** if events deviate from plan	33%	19%	43%	95%
2. View current **at-rest and in-transit inventory**	29%	14%	52%	95%
3. Visibility down to an **order-line level**	32%	18%	41%	91%
4. **Escalation policies** to help manage alerts	14%	19%	57%	90%
5. **ETA updates** based on actual events	36%	23%	27%	86%
6. Role-based views **for other departments**	19%	5%	57%	81%
7. Visibility into **mobile assets**	14%	19%	48%	81%
8. Time phased visibility of **future inventory position**	0%	24%	57%	81%
9. **RFID**-enabled visibility	5%	24%	48%	77%
10. **Resolution advice** or workflow	5%	24%	48%	76%

Source Aberdeen Group November 2006 (p9)

AT Kearney[xi] reinforces this idea by pointing out that when a business traveller loses luggage it is an inconvenience, but when a major company loses sight of key components in transit it can stall manufacturing lines, disrupt product deliveries and impose enormous negative economic impacts that are not easily or cheaply remedied.

In Kearney's paper 'Smart Boxes', a survey was conducted with high level supply chain and logistic executives in 100 top importing and 100 top exporting companies and they collaborated with the International Cargo Security Council (ICSC)[xii] to reach the organisation's international shippers. The executives were asked about their key concerns and about proposed supply chain solutions.



POFR stands for perfect order fill rate, a measure of order accuracy, timeliness, quality and completeness. Source A.T. Kearney

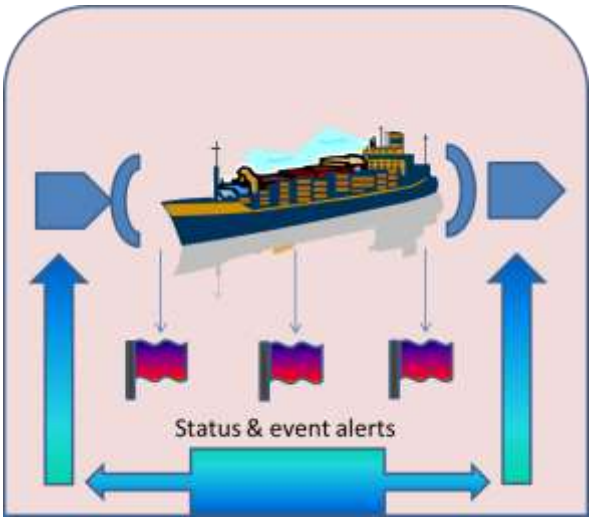
Working on the findings of all the major white papers that have conducted research into supply chain visibility within the Ocean Freight industry, there is a clear desire for, and need for, maturity within supply chain processes, that will give visibility to areas of container movement that have until now failed to provide management with the necessary clarity for efficient decision making. Once this visibility is provided and by integrating the information streams from the different actors within the supply chain system is becomes possible to improve the business value across the supply chain.

This process begins with integration of the core data, be it import, export, forwarder or shipping line into a system that is able to track the shipment throughout the process. This allows for management to incorporate the necessary data needed for effective management reporting, enable disruption management and to make improvements throughout the supply chain.

Source Aberdeen Group, November 2006

Solutions

Logistical Software covers the lack of information described above by creating supply chain visibility (SCV) through evaluating information from various types of sensors and other information sources, partially (pre-) processed by intelligent algorithms. At the same time incorporating core data from the clients main database systems to enable effective alert systems, stock control and management reporting creating a harmonised set of technologies applicable throughout the supply chain. This provides new found transparency in-house that can then be shared, if required, with any of the shipment stakeholders.



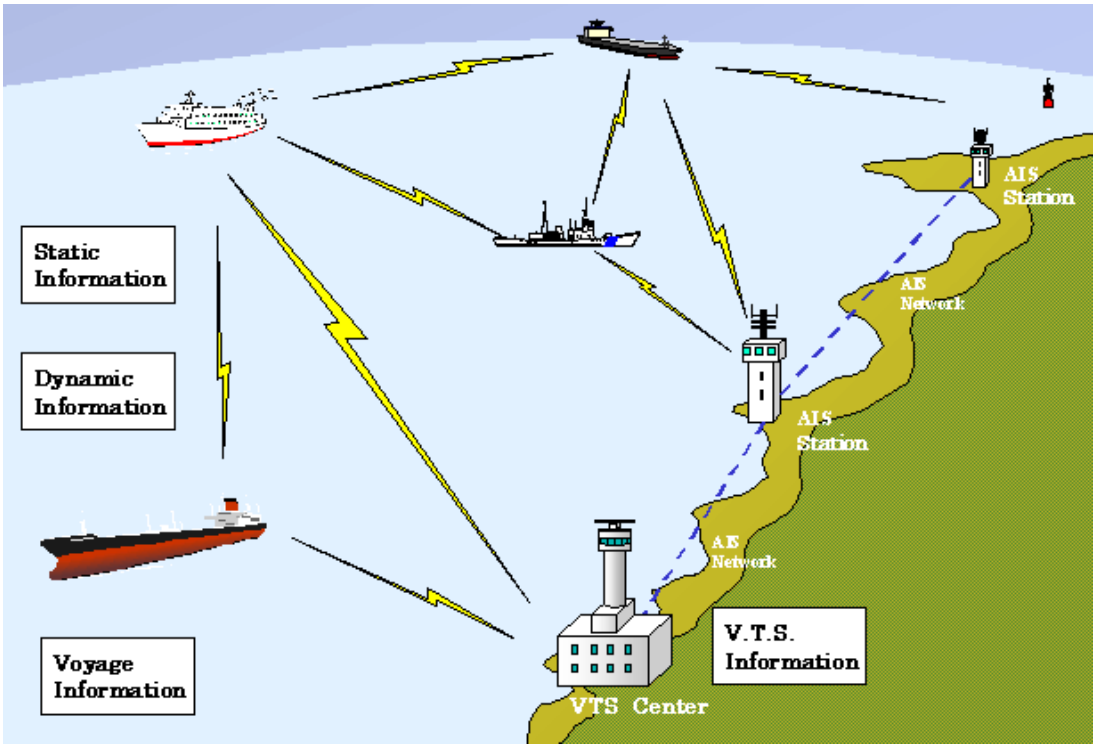
IN-TOOL and INTRACK (Logistical Software Ltd) combine to provide a global e-commerce, (EDI Agent) multi-carrier network for the ocean container shipping industry. The combined solution enables customers to efficiently and easily plan, book, manage and analyse ocean freight shipments with virtually all the leading carriers and NVOCCs. The incorporation of electronic submissions within the shipping documentation process enables additional software solutions that utilise the electronic data and incorporate it within additional systems that provide the necessary visibility.

Logistical Software developed **IN-TOOL**[xiii], to import, validate and send through its own administration and management server tools both Booking Requests and Shipping Instructions, allowing for additional data elements to be matched with and associated with container movements.

Almost all the carriers provide at the least a set of eight mandatory status events, including date of receipt, gated out. Gated in vessel loaded, departed and arrived and gated out. **IN-TOOL**[xiv] can obtain vessel information both from the carriers status event systems and from the vessels own Automatic Identification System (AIS).

The Automatic Identification System is a ship tracking network using VHF transponders. Every ship above 300 tons needs to have an AIS transmitter 2008 based on IMO[xv] regulation of 1998 which emits around 20 parameters periodically in the VHF band.

The International Maritime Organization (IMO) is the United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine pollution by ships.

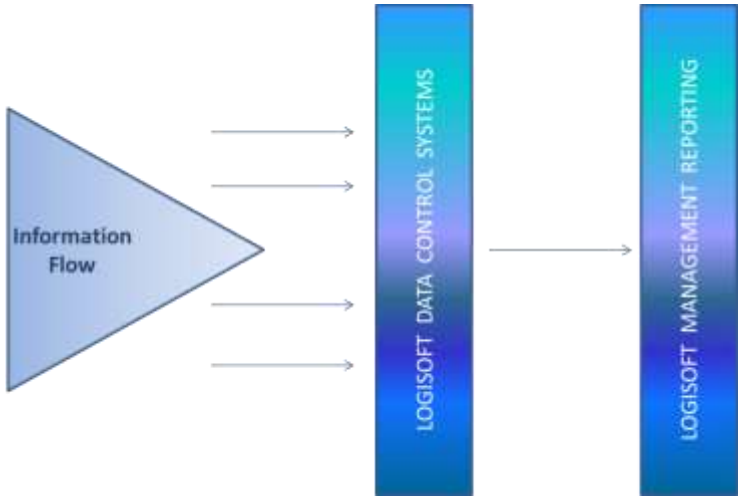


The AIS updates, which include information regarding the ship's current position, speed over ground, next port of call and the estimated time of arrival can be used to provide the basic (if data not available from the carrier) or additional information regarding the progress of the shipment and enhance the alert process in situations where the carriers own alerts, dependent on notification from the port is unreliable or non-existent. Additional algorithms are applied to the AIS data that enable last port visited and time of departure and changes to the port of destination. Beyond creating alerts that may require logistic response, the AIS data, and the additional information collected, can also be utilised within management reporting systems regarding problematic shipping lines, identifying specific voyages that cause bottlenecks and aid in identifying ports where additional leeway needs to be provided within the supply chain logistical calculations.

The combined solution provides for benefits of additional visibility to be attained by ensuring data quality across four main categories; Intrinsic, Accessibility, Contextual & Representational.

Data Quality category	Data Quality dimensions
Intrinsic	Accuracy, Objectivity, Believability, Reputation
Accessibility	Accessibility, Access security
Contextual	Relevancy, Value-Add, Timeliness, Completeness, Amount of data
Representational	Ease of understanding, Concise and consistent representation

IN-TRACK[xvi] Providing web transparency links with the IN-TOOL[xvii] e commerce Shipping application, and / or, Purchase Orders and Packing lists files received from third party ERP systems and/or Bills of Lading and Booking Confirmations received from the carriers. Purchase Orders and or Packing List data files received from Retailers and Manufacturers can populate IN-TRACK in addition to, or, in place of, IN-TOOL submissions. Once this information is contained within the combined systems it enables the reporting mechanisms to ensure visibility, empowering the necessary decision makers.



The balance score card (Kaplan and Norton[xviii]), is based on the viewpoint that a performance measurement system should give managers adequate information to answer four questions. Brewer and Speh (2000) adapted the balance score card to evaluate supply chain performance. Based upon the INTEGRITY Report findings the combined solution gives clear 'Possible Indicators' of goal achievement against all four of the score card questions.

Balance score card **Questions**	Supply chain performance (Brewer and Speh (2000)[xix] and based on Integrity report findings(2011)[xx] **Goals**	**Possible indicators**
Internal business perspective: What must we excel at?	Waste reduction Time compression Flexible response Unit cost reduction	Supply chain cost of ownership Supply chain cycle efficiency Average response time % of supply chain target cost achieved
Innovation and learning perspective: How can we continue to improve and create value?	Process innovation Partner Management Information flows Threats/substitutes	Product finalization point Product category commitment ratio Number of shared data sets Performance of competing chains
Customer perspective: How do our customers see us?	Improved service quality Improved timeliness Improved flexibility Improved value	Number of customer contact points Customer order response time Perspective of flexible response Customer value ratio
Financial perspective: How do we look to our shareholders?	Higher profit margins Improved cash flow Revenue growth High return on assets	Profit margin by supply chain partner Cash-to-cash cycle Customer growth and profitability Return on supply chain assets

Following on from these indicators, it is possible to apply the benefits from the combined solution against the enhancements desired in the research by the Aberdeen Group Report, to visualise the performance against the benefits desired.

Enhancement	Have today	Plan to add In next 2 years	Interested but no formal plan	Total Interest Level	Covered By Logisoft System
1. **Warning alerts** if events deviate from plan	33%	19%	43%	95%	YES
2. View current **at-rest and in-transit inventory**	29%	14%	52%	95%	YES
3. Visibility down to an **order-line level**	32%	18%	41%	91%	YES
4. **Escalation policies** to help manage alerts	14%	19%	57%	90%	YES
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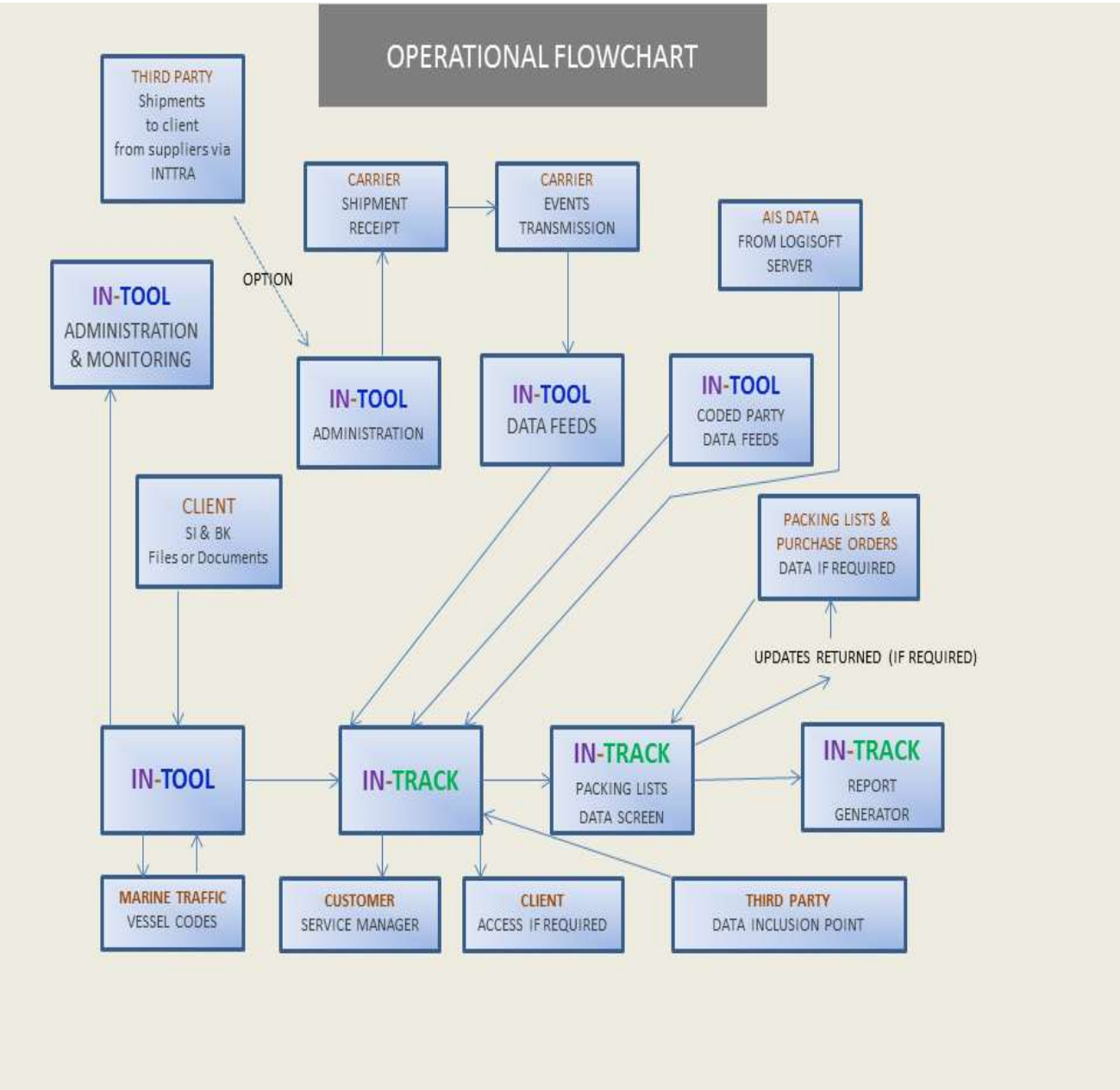

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[iii] Rotterdam School of Management Erasmus University, Viñoly Building, 21st Floor, Claude Debussylaan 46, 1082 MD Amsterdam, The Netherlands. Website: http://www.rsm.nl/
[iv] Cross-border Research Association, CBRA-BMT Ave d´Echallens 74, 1004 Lausanne, Switzerland. Website: www.cross-border.org
[v] Aberdeen Group, 451 D Street, 7th floor, Suite 710, Boston, MA 02210 USA. Website: http://www.aberdeen.com/
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[vii] p2, The Supply Chain Visibility Roadmap.
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[ix] p17, INTEGRITY Final Report. Delivered 31/12/2011
[x] P4, The Supply Chain Visibility Roadmap.
[xi] A.T.Kearney: Smart boxes - RFID Can Improve Efficiency, Visibility and Security in the Global Supply Chain, Chicago
2005, p. 9
[xii] The International Cargo Security Council is a professional association of cargo transportation and security professionals from the entire spectrum of cargo security: air, truck, rail, maritime, and intermodal. International Cargo Security Council (ICSC) 3 Church Circle #292, Annapolis, MD 21401

[xiii] IN-TOOL, Providing transmission of shipping instructions and booking requests to electronically, complete with validation, review and amend prior to transmission. www.logistic-software.co.uk/intool.html

[xv] International Maritime Organisation, website: http://www.imo.org/About/Pages/Default.aspx
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