



Real-time Visibility In The Chemicals Industry

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**“Visibility is a capability,
not an IT taxonomy”**

Lora Cecere, Founder of Supply Chain Insights

Executive Summary

Visibility is a broad term

For chemical companies who are dealing with complex, dangerous shipments, there can be real added value found throughout the supply chain when real-time visibility data complements a supplier’s existing information.

The market has shifted as traffic conditions worsen, chemical storage capacities remain stagnant, and customer expectations increase, so we explore how real-time visibility can work for a chemical company to help solve these and many other challenges when integrated properly. We measure the value that can be gained for an organisation who successfully integrates real-time visibility into their processes and show how your supply chain and logistics can actually become a competitive advantage. Integration of real-time visibility isn’t

always a seamless process though, so we dive into some of the common challenges suppliers face as they work to make the shift themselves. Legacy systems, a lack of collaboration between the many parties involved in the supply chain, and slow technology adoption rates by carriers are just a few of the potential chemical companies could face. Despite the difficulties, we offer some creative solutions to these and other problems that may arise during the implementation process.

We conclude with a look into the process for determining a strategy that will work for your unique organisation. **Working with the right company** that will help provide an integration strategy that works with your systems and your people is critical.

Visibility could mean anything. It's a buzzword, designed to fit in almost any context.

Visibility, a Buzzword

with Many Meanings

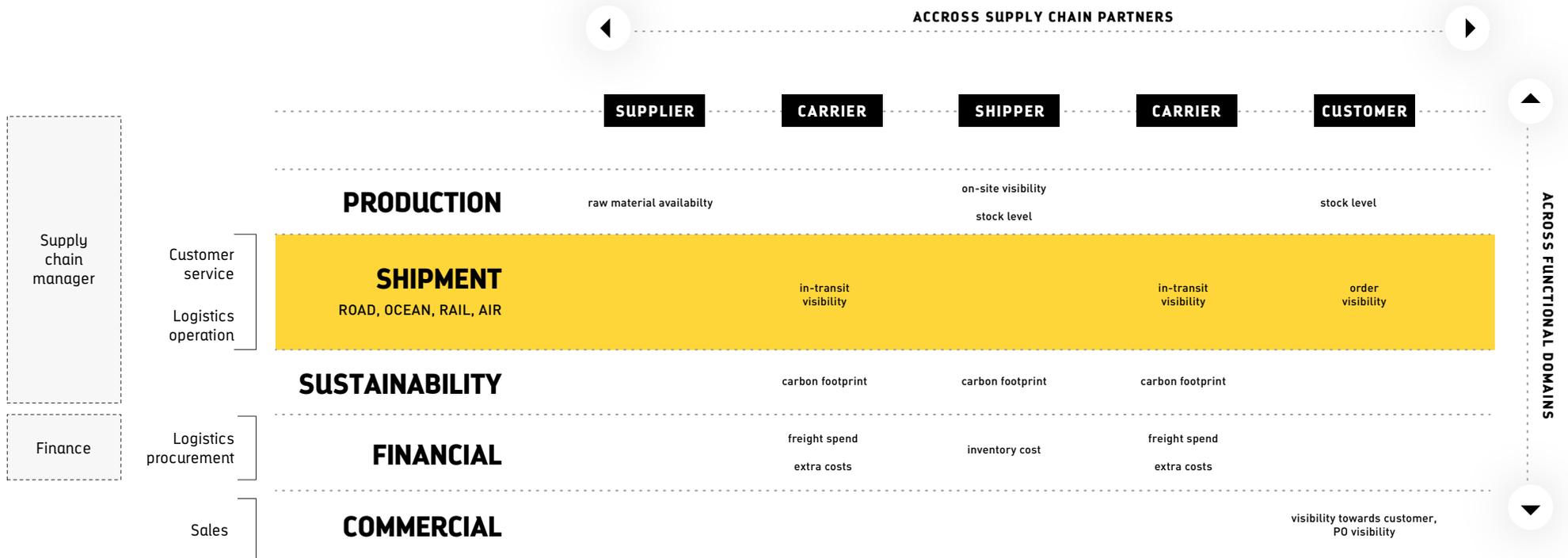
“Visibility still means many things, depending on who you talk to,” was one of the conclusions of our recent roundtable with some leading chemical companies. So how can you use it to your advantage in the chemical supply chain industry?

The Global Quality & Service Manager at ExxonMobil got us thinking about the term visibility and how we can most effectively use it for the SC organisation. She asked, “What type of real-time is really needed to serve our customers better? What does real-time mean?” Each organisation has their own unique needs, and a standalone data stream of visibility

doesn't help the decision-making process on its own. We'll explore in-transit, on-site, and customer visibility, the information that could offer the biggest impact for the chemicals industry, and the technologies that would pair well to reach measurable benefits and help prepare your organisation for success.

What is visibility

A number of internal and external parties are involved throughout the supply chain process, each with their own interpretation of visibility. This graph highlights the various definitions of visibility depending on which parties are involved. The rest of the white paper will focus on in-transit and on-site visibility, with the aim of providing exceptional service to your customer.



What is your highest priority in terms of real-time visibility?

87%

1. Transparency and visibility toward my customers.

13%

2. In-transit visibility on all my shipments.

Where would real-time visibility bring the most value in your business?

“Improve the customer experience with on-time, in-full performance.”

93%

93% of all attendees



Recent survey

In a **recent roundtable**, we asked attendees a few questions to gauge top priorities when it comes to having real-time visibility. The answers to these questions were enlightening, and highlighted how critical passing on this real-time data is throughout the supply chain process.

So what is truly driving the real-time visibility, and how do you most effectively take advantage of technology to introduce these new capabilities to both your customers and your bottom line?

Market drivers



The dangerous and complex nature of the chemical supply chain requires unique real-time visibility needs.

The market is shifting in response, and there are new technologies available constantly to the suppliers.

So what's next for real-time visibility? Wim Farasyn of Lanark has some ideas on how to make it work better within an organisation: "We can use real-time visibility to create automated processes that allow us to work proactively on things that might become an issue instead of just reacting to problems after they've already gone wrong."

Transport Capacity Shortage

There's an ongoing balance of power when it comes to a shipper's price demands and the carrier's ability to meet them. Shippers have historically squeezed carriers on cost, but that balance is shifting.

According to Gartner¹, "With the shortage of carrier capacity, shippers that can create efficiencies with increased visibility become the 'shipper of choice.' Those that cannot, continue to struggle with securing capacity and with contracted carriers accepting their tenders."

With so many shipments going out every day, carriers now have leverage in this negotiation. Shippers must improve their visibility and internal processes to find the carriers they need that will ship their materials to customers in the most efficient and cost-effective way.

1 Bart De Muynck and Christian Titzel, Market Guide for Real-Time Visibility Providers, (Gartner, 2018)

The Amazon Effect

Business-to-business expectations are heavily influenced by the business-to-consumer experience. When Amazon provides free, one-day shipping, your customers start to look for an equivalent level of service in their chemical deliveries. This has led to the supply chain serving as an opportunity to differentiate yourself from competitors. The logistics process and the ability to meet customer expectations has become an integral part of the customer experience as a whole.

Traffic Congestion

Traffic congestion is getting worse every year, especially in the “capital of traffic jams”: Antwerp. The port of Antwerp staked its place as the heart of the chemicals industry in 2018 with significant investments by large chemical manufacturers valuing over €5 billion.

Unfortunately, the city is not always able to meet demand beyond the port due to limited road infrastructure. Traffic is consistently becoming more congested every year, and this has the potential to cause major concerns related to chemical storage capacity and jeopardised production. Strategically-timed road travel and real-time, in-transit visibility could help to significantly mitigate these issues.

Customer-Oriented Supply Chains and Segmentation

As the industry gains new insights into the supply chain, chemical manufacturing companies are starting to segment their customers. Specific groups of customers may require similar logistics needs, such as varied levels of transparency and shipment cost, so shippers are instead organising their logistics

around the needs of the recipient. Segmented customer groups are not yet proven, as the supply chain tends to be product-driven rather than customer-driven. With access to the right technology and data, chemical companies can create a customer-centric supply chain in which logistics can be tailored to meet the needs of each segment.



Traffic congestion is getting worse every year, especially in the “capital of traffic jams”: Antwerp.

Just having real-time visibility brings you zero value

In-transit, real-time visibility is a crucial data stream, but unfortunately it cannot help the decision-making process on its own.



There is no value in real-time visibility without proper integration of this information into other systems on the supply chain and the right pairing with other assistive technologies.

“Just having in-transit, real-time visibility data will not bring any additional value to a company,” said Nick Poels, CEO of SupplyStack. “Visibility is just an ingredient, not the whole dish.”

Even without standalone value, it is still one of the most crucial data streams required to digitally trans-

form your supply chain and logistics operations. This makes finding the right technology stack and seamlessly integrating these individual data streams across your entire supply chain absolutely critical to remaining competitive in a constantly evolving business environment. By finding that unique mix of technologies and precise integration strategies that work for your company, you’ll see a number of swift, measurable benefits.

The Advantages of Fully Integrated Real-Time Visibility

1

Improved Customer Service Levels

Today, the role of the customer service team is often reactive by necessity: they step in when there are problems. By establishing real-time visibility, you know when problems are likely to arise and can instead proactively prevent them and provide transparency to your customers.

Customer service teams can reach out when shipments may arrive late or when something may be damaged instead of waiting for angry phone calls. Real-time visibility enables companies to provide this hands-on service, or even offer a self-service portal with full tracking information for shipments in transit.

“We’re becoming more service-oriented instead of product-oriented,” said the Senior Logistics Manager at Suez. Instituting real-time visibility into your customer service strategy will fundamentally shift the role of your employees. Instead of spending time reacting to existing problems, they will be able to develop a strategy to prevent them from becoming issues from the start.

2

Better On-Time Performance

Real-time visibility allows you to better predict and anticipate in-transit issues so you will have the opportunity to correct potential problems and prevent them from recurring in the future.

Was there a delay at the loading site? Was the carrier delayed? Why? You can find the answers to these questions and any others that might cause unforeseen issues to identify bottlenecks and correct them for future deliveries.

3

More Efficient Site Operation

Optimisation of your loading sites is extremely difficult when you don't know when trucks are going to arrive. So instead of treating site operations as a wholly reactive role, site operators can instead use real-time ETA information to optimise on-site logistics. As an example, teams are able to make real-time decisions to make room for one delivery that may be early by taking the place of one that may be late.

Operators can act as strategic planners instead of constantly managing the consequences of deliveries not arriving as anticipated.

4

Real-Time Transport Management

Historically, transportation planning has been hampered by information silos within an organisation and shadow IT functioning outside of it. These both cause issues with the necessary information reaching the person who needs it the most, preventing fully-informed decision-making.

When real-time in-transit visibility is tightly integrated with the transportation management system (TMS), decision-makers will have the information they really need to make the best choices that will help improve delivery performance. Streaming visibility data can continuously enrich your TMS with context throughout the delivery process, and introduce a new level of automation where specific events can trigger workflows, alerts and updates.

5

Improved Customer Retention

An often underestimated reason for investing in real-time visibility that could improve the value of your organisation: reduced customer loss. When a dissatisfied customer leaves, you not only lose the revenue, but also incur huge costs in acquiring a new customer to make up for the lost revenue. Excelling in customer service and constantly delivering an exceptional experience should be every organisation's top priority.

Even with all these potential benefits, integration of real-time visibility is not always a smooth process. There are still obstacles that need to be taken down prior to chemical companies seeing the results they are hoping to see.

Challenges in Obtaining

Real-Time Visibility

So, what are the roadblocks slowing the adoption of these new technologies?

- Required collaboration with multiple parties
- Reliance on human intervention
- Combined with an workflow
- Transforming data into actionable information
- Nascent technologies
- Proper integration of data into current processes
- Inaccurate or incomplete information

Required level of visibility

The required level of in-transit visibility can vary depending on the requirements of the shipment and type of transportation.

The Challenge

For example, dangerous chemicals and time-critical shipments may require a much more detailed and accurate level of in-transit visibility compared to low-value, bulk goods. Your largest customers might also require some extra attention and additional transparency compared to lower-volume customers.

Unfortunately, in all cases, you rely heavily on the technical capabilities of your carrier and their willingness to share visibility data. Even when this information is shared, it isn't necessarily accurate.

"Calculating an estimated time of delivery based on a GPS location from the carrier may lead to inaccurate information. It often lacks contextual details, like traffic data, a driver's

remaining driving time, intermediate cleaning stops that might be planned for the truck, or anything else that might get in the way of an on-time delivery," said Alex Lisitzky, Head of Product at SupplyStack.

Shippers are now setting up real-time connections that capture location data directly from the carriers. This now commonly-used technology isn't a perfect solution though, as in many cases, linking the location data to a shipment requires manual intervention by the carrier. The carrier would need to log in to a portal and select their truck's license plate, then assign it to each individual shipment.

This is inevitably an error-prone process given the required level of human intervention, but it does still provide you with a certain level of visibility. Given the relatively high

potential for erroneous data, this information should be used cautiously when making predictions and taking corrective action.

In the chemicals industry, a shipment may be split between a series of trucks and drivers, further complicating the delivery process. Different carriers can be used for preloading, international trips, and sometimes another carrier or truck the unloading. Even when only one carrier is involved there is a margin for error, so having multiple carriers that will each be responsible for manually assigning the proper truck to the correct shipment throughout the process leaves far too many unknowns for any degree of accuracy.

Real-time visibility is necessary to make accurate predictions and inform customers of the status of their shipments. When this visibility is based on manual processes though, the assumptions a company may need to make could result in mistakes and unhappy customers.

To take the guesswork out of the delivery process and provide customers with accurate information, much of this must be automated. They must be integrated at both the shipper and the carrier level as well, potentially creating additional collaborative. Equivalent adoption, nascent technology, and manual human intervention all slow prospects for automation throughout the supply chain.

Finding the Solution

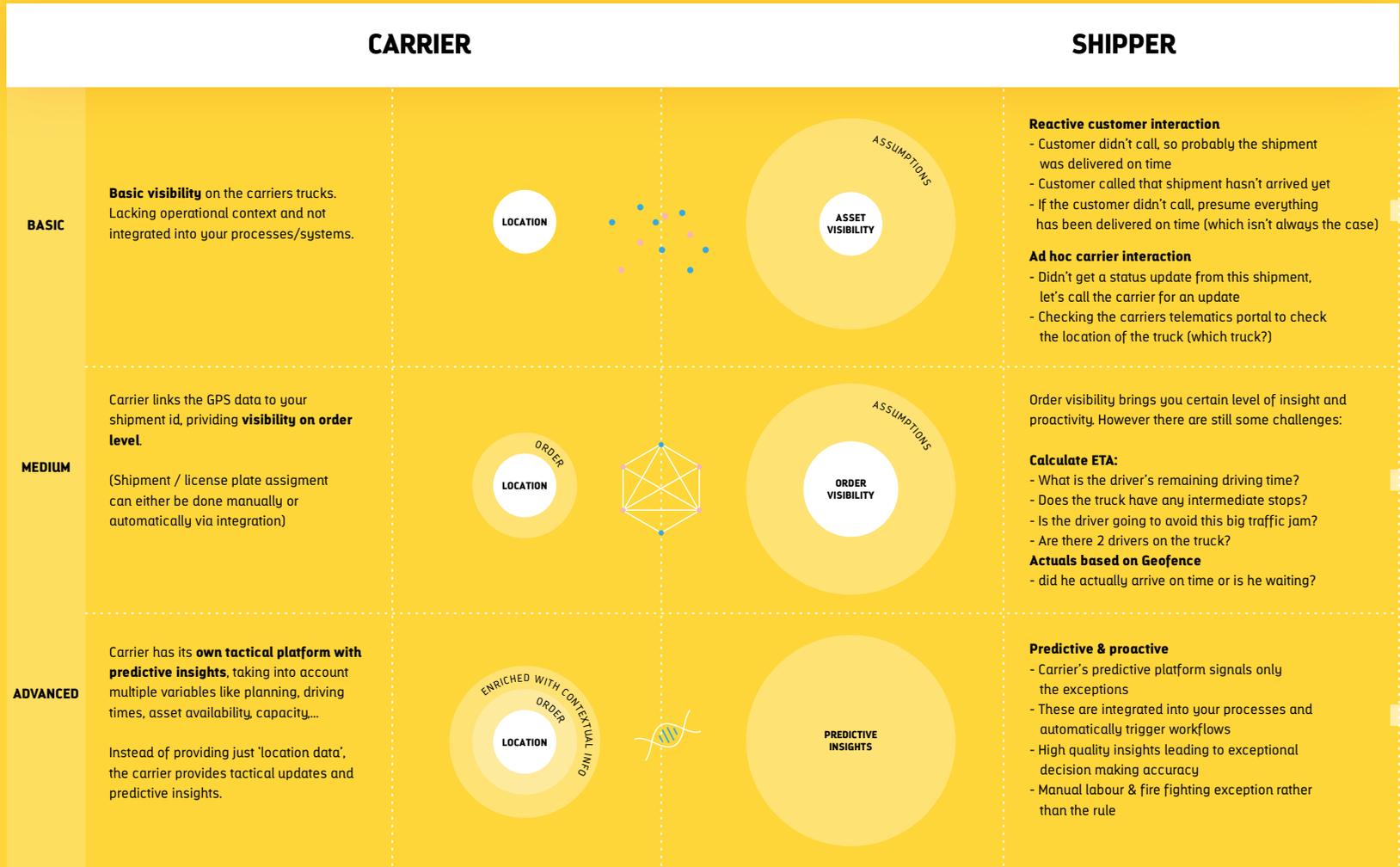
Automation and information accuracy will help remove assumptions and enable your organisation to use real-time visibility for decision-making. So how do shippers in the chemical industry achieve these levels of automation?

The digital maturity and technical capabilities of a carrier directly correlate to the level of visibility you can achieve during the supply chain process.

- ✓ Choose digital-forward carriers
- ✓ Pair location data with additional information
- ✓ Minimise assumptions by improving the context of data provided by carriers and other external data sources.



LEVEL OF MATURITY



REACTIVE
Reactively check where shipments are and why they are late

LIVE
Real-time big data tells you where their shipments are right now and automatically updates actuals

PREDICTIVE
Predictive analytics tells you where your shipments are going to be in the future and identify future disruptions so they can be avoided

When selecting your carriers, take into account technology adoption and assess the level of digitalization.

Carriers in 'predictive' maturity stage will not just provide visibility data (GPS) but provide **accurate and reliable updates for shipments** that might be late or require attention.

Would you prefer:

- GPS data for 100% of your shipments, leading to 60% ETA accuracy?
- Or 100% reliable updates for 10% of your shipments that require attention?

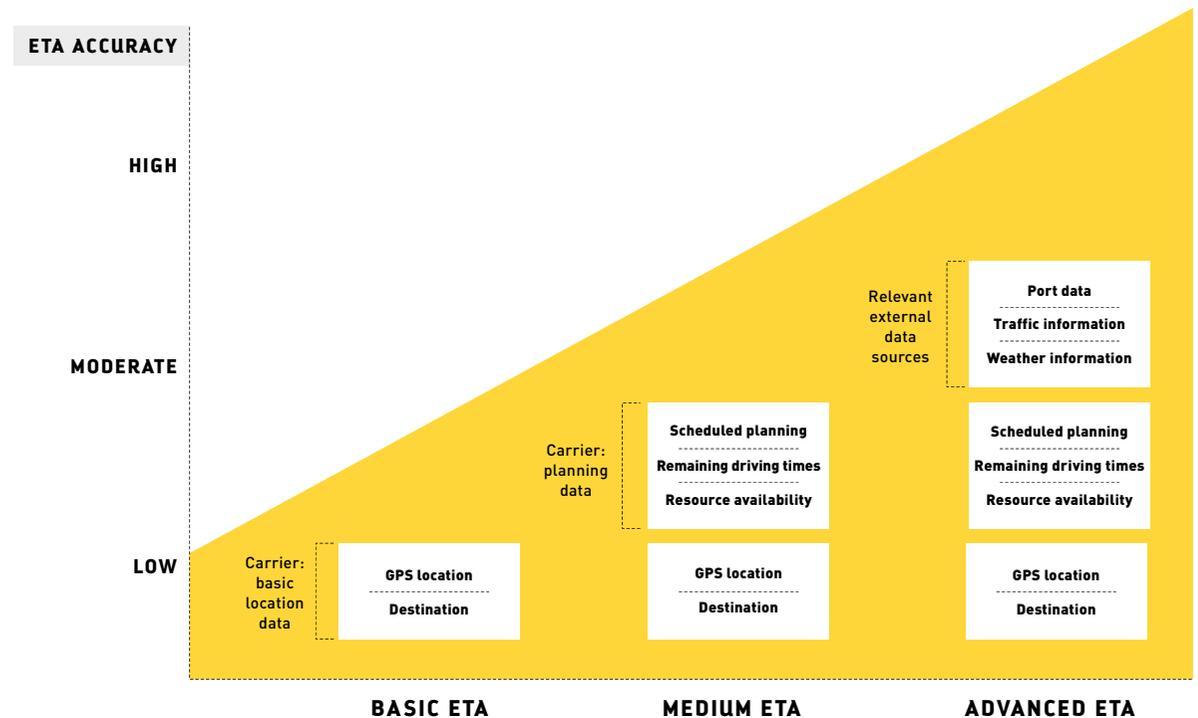
ETA calculation

There can be huge variances between the concept of data and information. Real-time visibility may look like enough information to aid in decision-making, but in situations like estimated time of arrival (ETA) calculation, a lack of context can cause major problems.

First, define what level of visibility you require. How accurate does your ETA need to be? Do you need to know up-to-the-minute information, or will an estimate within a few hours suffice? The following chart explores the level of ETA accuracy based on the data that's available.

Some suppliers on the market today provide a visibility platform that will gather location information from a host of different carriers. These platforms then calculate ETAs based on the shipments current location and destination, but don't take into account some essential contextual details that would contribute to an accurate and reliable ETA. If you just need a general estimate, this strategy may work for you.

If your organisation needs an exact time of arrival, as do many chemical companies, instead of asking a carrier for GPS location data to calculate your own ETA, request real-time ETA information directly. The carrier is likely the only party throughout the supply chain who possesses all the necessary contextual information required to calculate an accurate and reliable ETA.



Actuals

Instead of relying only on the “estimates” in ETAs, it may make sense for your organisation to add in the benefits of actuals. The actuals are calculated based on geofences that will give you a direct and precise indication of when a truck has arrived or departed a specific location.

This data alone isn't enough without context though. Additional details, like loading or unloading time, necessary waiting time due to a full loading dock, or something as simple as delayed paperwork may cause an organisation to make an assumption based on misleading actuals.

If you're seeking detailed visibility, you will need more than just location-based geofence triggers. To achieve the necessary on-site visibility, you need to make information-based decisions, organisations can use:

- ✓ **Yard management software: this is particularly relevant for your own site where you can collect and use this data. However, when loading or unloading at an external site, you will likely not be able to capture this information.**
- ✓ **Activity monitoring via an on-board computer: Modern on-board computer systems require drivers to consistently register all activities. These systems track driving (automatically), waiting, loading, and any other activities that may influence delivery. Depending on the carrier's maturity level these details can be integrated into your TMS.**

When tracking the supply chain process through these types of programs, organisations can measure variations between carrier delivery times, efficiencies of internal and external sites, and find any bottlenecks along the way.

It's not that GPS location data doesn't provide any value to understand your shipment arrival time. Today, it's often the only way of achieving visibility for shipments. But when we look toward the future, as carriers are working to digitise their operations, this is just the beginning of an evolution where carriers will provide predictive insights to shippers based on their internal operations. **Shippers just need to have the infrastructure in place to act on more than just isolated GPS data.**

A lack of trust

The Challenge

One of the main barriers to real-time visibility is unfortunately a sensitive issue that can't be solved by an investment in new technology: it's a lack of trust between the shipper and the carrier.

Data sharing between parties is a challenging issue already, but carriers tend to be more protective of their data for fear that opening up their data could be used against them competitively. Carriers fear that technology advancements such as real-time visibility, autonomous vehicles, and horizontal collaboration may reduce their value and make them obsolete.

We'll go into further detail on this in a future white paper, but this protection of information is acting as an impediment for future progress right now.



Finding the Solution

Instead of asking for full access to all of your carrier's GPS location data, limit your request to predictive insights that will provide a highly accurate status for your active shipments. This alternative to full data access will still provide the information you need as a chemical company. Your carrier will automatically flag any exceptions for you, both providing you the information you need to make decisions on the status of your shipments while also masking the complexity behind the carrier's detailed data.

When managing complex deliveries, would you prefer to receive continuous but limited GPS location data, leading to just a 60% ETA accuracy? Or instead, work with an intelligent, status-driven system that only flags shipments where the true ETA is

either ahead or behind schedule? We think the latter.

This approach to limited data sharing supported by an intelligent, status-driven system is also preferred by the carriers. The reservations of data sharing by some of the leading chemical carriers stem from a fear of sharing full insights into their own operations management, so this solution protects the carrier's operational intelligence while providing new real-time visibility to suppliers.

Most carriers still aren't sufficiently digitised to deliver this type of information yet, but when selecting a carrier, partner with those who are actively working on achieving this level of visibility.

Outdated Systems

The Challenge

Once you're able to capture this new real-time visibility data, it will unfortunately become clear that this new data doesn't necessarily fit with existing legacy systems.

Most organisations use enterprise resource planning (ERP) systems to manage their data, and as Gartner¹ explains, this has worked well in its limited capacity in the past: "ERP as a mature application suite has been leveraged across companies for decades. Its main purpose is to provide a backbone for transactional and financial processes and data—an enterprise transactional system of record."

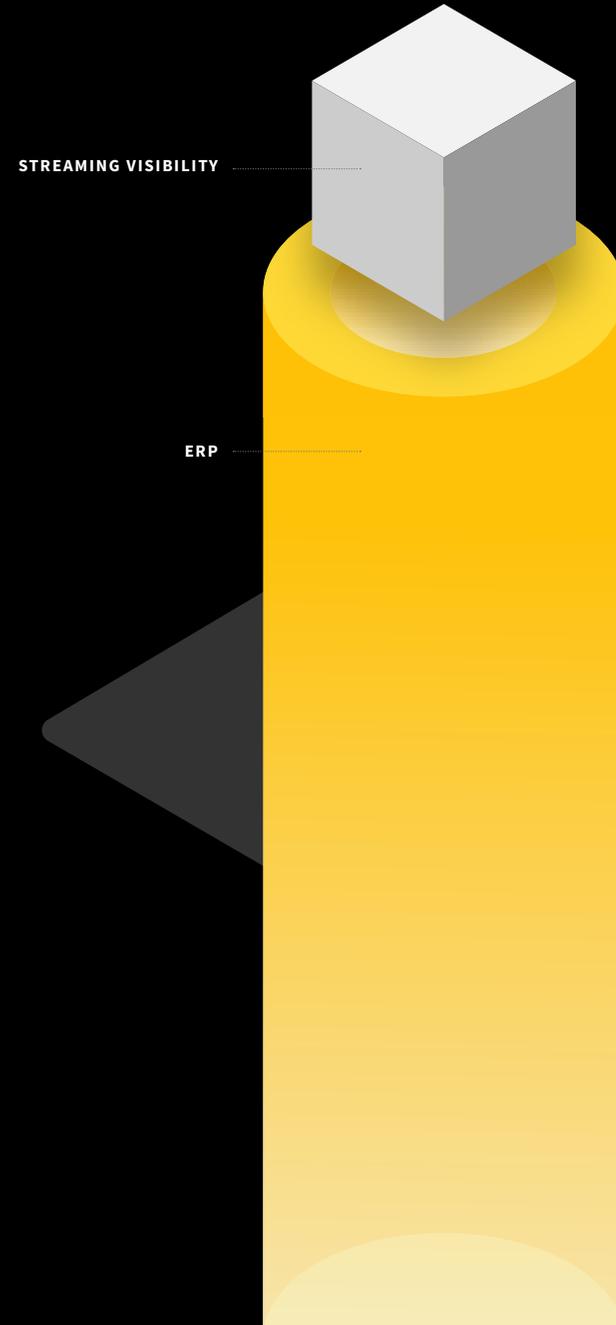
Unfortunately, this just now isn't enough to incorporate and process the complexities of real-time data visibility. The rigidity of ERP software doesn't leave room for ever-changing real-time data. Author Lora Cecere said, "What has happened in the world of supply chain is that we have a lot of sensor data. We have GPS data, weather data, telematics data, RFID data, but no place to put in traditional architectures and systems."

As an interim step, some organisations have incorporated new columns to track shipment ETA into an existing ERP or a classic TMS. This serves more as a band-aid to the overall issue though, and doesn't provide the true benefits

that real-time visibility would offer. Performance may suffer as well, since the system was not designed to handle this continuous stream of data.

To achieve the measurable results chemical companies are seeking, data analysis and automated workflows will require a much larger shift in your ERP or TMS by adding in dedicated and specialised systems.

¹ Bart De Muynck and Christian Titze, Market Guide for Real-Time Visibility Providers, (Gartner, 2018)



“A continuous stream of real-time data is useless without something that can analyse data”

Finding the Solution

Legacy systems aren't designed to support continuous data streaming from external sources, so the first solution to this issue is to add a layer on top of your existing IT landscape. This layer will help to bridge different departments and existing silos within your legacy systems, helping to put your newfound real-time visibility to use for both internal and external stakeholders.

In a perfect world, the data sourced from in-transit visibility plugs into the logistics of your supply chain like the human central nervous system. A human body communicates sensory signals to the brain that interprets

them. The role of the brain is critical to this process, because without it, there is just a swath of data. As a chemical company, you need something that can capably interpret the information you receive along the supply chain and take appropriate action when necessary.

A continuous stream of real-time data (not just visibility) is useless without something that can analyse data and provide information that will aid in decision-making. You don't need to see every bit of data along the way—just the exceptions that will cause problems with your shipment arrival time. Your logistics “brain” senses these problems for you and alerts you, allowing you to take necessary action.



Visibility Integration

The Challenge

As we've discussed, real-time visibility is not an effective standalone decision-making tool. There isn't much value in adding a separate platform where you possess your real-time visibility information and the rest of the details on your supply chain are hosted in another. For it to become an efficient part of your supply chain, it must be integrated across all of your systems, and included in each functional domain.

"Our traditional processes are very inside-out—we're not good at allowing outside-in signals," said Cecere.

At our industry roundtable, we asked attendees how well-integrated real-time visibility was in their systems. Here's a summary of their responses.

How is visibility data embedded in and impacting your existing processes and systems?

59%

None - I have no visibility at the moment.

0%

Automated - The stream of visibility data is successfully integrated into workflow processes and some actions are automatically triggered.

33%

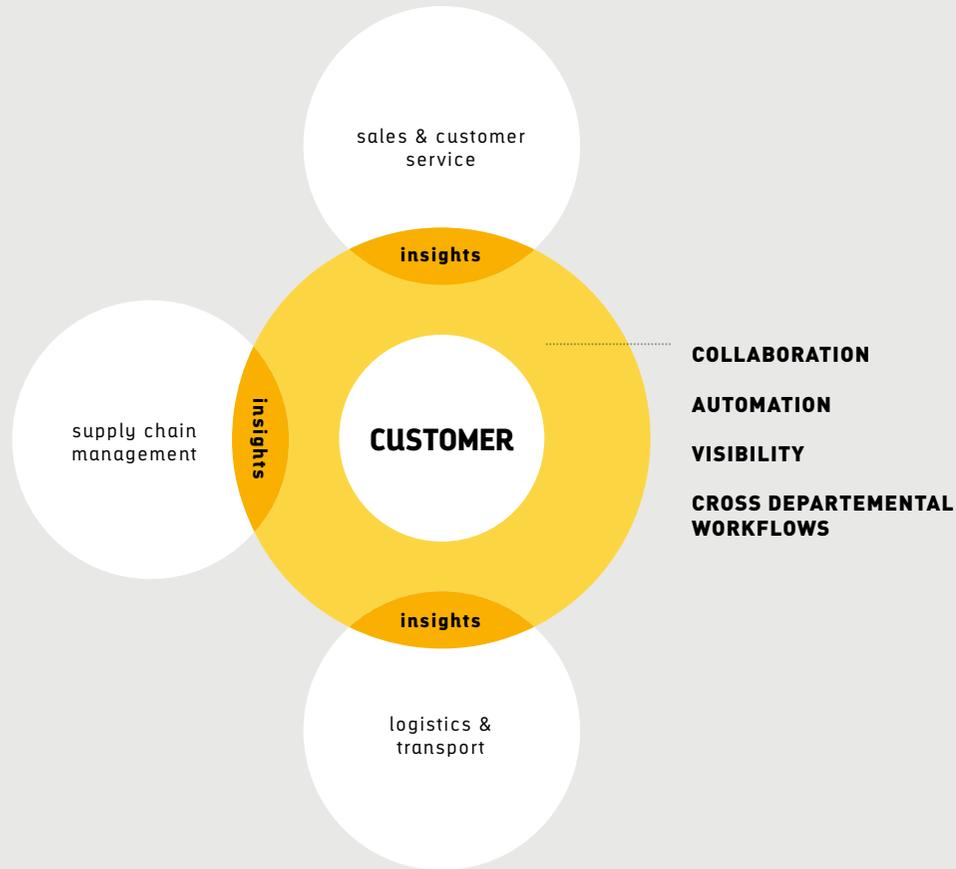
Isolated - Visibility data is isolated, but not embedded in my systems (e.g. I just see an ETA and location in a separate portal).

0%

Highly Integrated - Visibility data is at the core of my operational TMS. Processes are fully automated, I am properly alerted to any exceptions, and this visibility is extended to my customers.

8%

Informative - The metadata is added to the ERP or TMS (eg. Just an ETA column).



Finding the Solution

By fully integrating visibility data into the supply chain, chemical companies can empower their employees to make decisions that will drive value every day.

Integration: 1+1=3

Combining the transactional data sourced from an ERP, TMS or customer management system with contextual data collected from a carrier provides your team a holistic view of the full supply chain.

Employees are able to see the basic operational information they need, such as shipments, delivery times, carriers, contact information, or materials, paired alongside the real-time information that provides context for that operational data.

A full overhaul of your legacy system may not be possible, and we know these systems aren't always built for real-time integration. The best practice in this situation may be

to add a smart layer on top of a fragmented IT landscape, helping to integrate each of your isolated back-end systems.

If you're not able to completely rebuild your system, focus on how you can make changes now that will still work to integrate data you have with information you need. As a chemical company, your goal should be to extract data, enrich your systems with contextual information, collaborate between departments, and act.

Relevant domain Insights

Once successfully integrated, real-time information can be shared across your entire organisation. Externally and internally sourced data can now work together to uncover new information and share just the most relevant details to the appropriate teams.

Collaboration & Communication

A holistic view on operations won't help a large team without regular collaborative communication. Both internal and external stakeholders must be informed of any process or system changes, incidents must be discussed and questions must be answered. Even with the context provided by successfully integrating real-time

visibility into your system, real value will be found with in-system, cross-team collaboration. If team members start communicating without the context of the system itself either via phone or email, you lose the contextual value you've just gained.

A successfully integrated system with team communication layered on top of it is the foundation of a fundamental transport execution history composed of both events and human connection and collaboration in a single environment.

Workflow automation

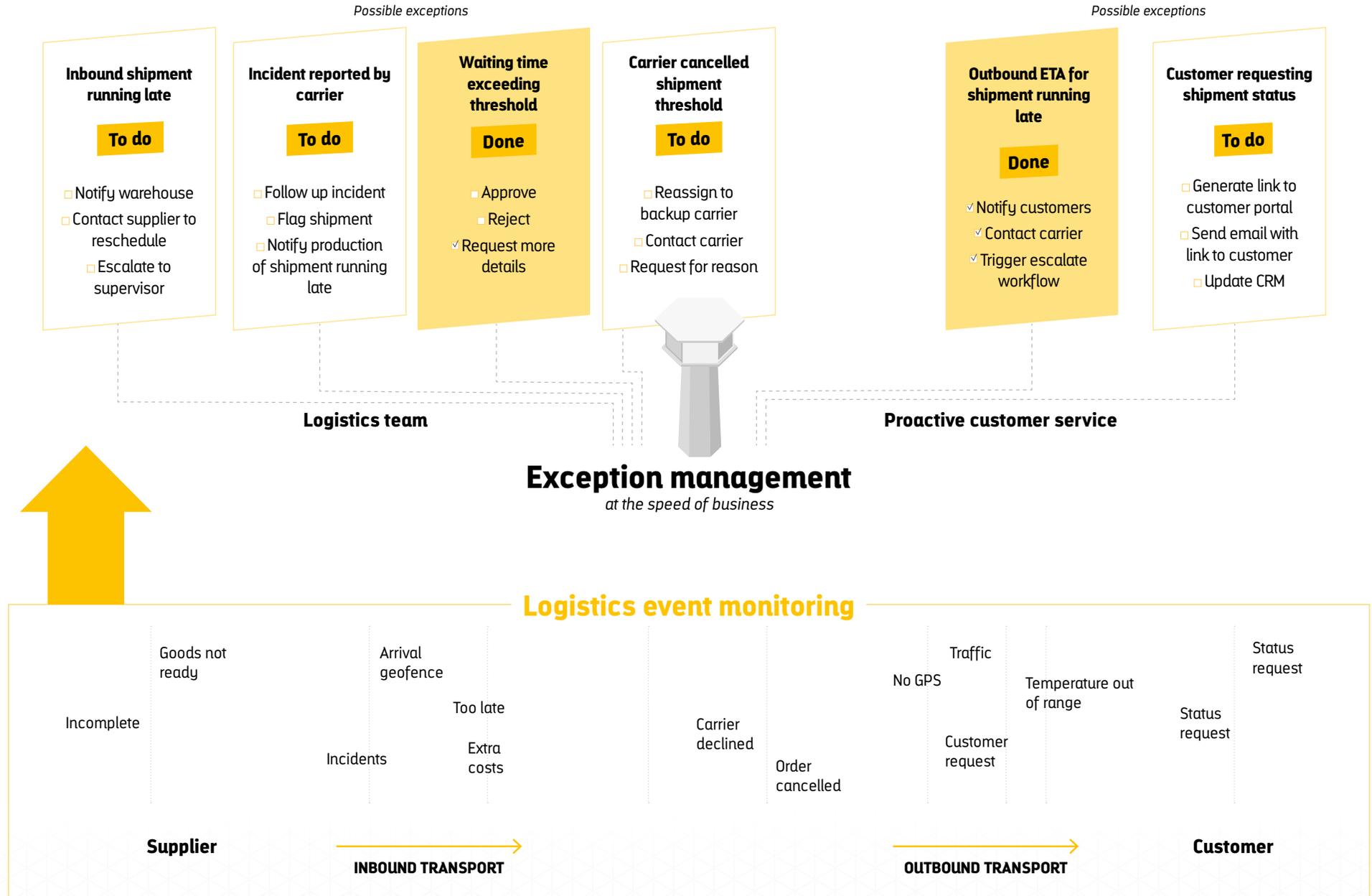
Once these layers are properly integrated, you can set specific actions to become automated in the event that an issue arises. In-transit visibility allows your team to auto-

mate workflows that were previously either impossible because of a lack of data or unreliable because they were dependent on manual processes.

Your team will now be able to automate necessary repetitive processes brought on by flagged issues that are based on real-time events. Instead of manually monitoring the location of your shipments, event monitoring will do this for you and take the appropriate action you would have taken yourself when certain conditions are met.



Real-time visibility workflow automation



Extending Customer Visibility

Applying real-time visibility to your operations will allow your teams to evolve from a product-based approach to one that centers around your customers. Instead of spending time reacting to daily unforeseen issues and searching for more information, your team can focus on delivering exceptional customer service.

Once your team is able to manage the newfound information and automation that comes with real-time visibility, you can extend this to your customers through a self-service portal where they'll be able to see all of this for themselves. Transparency and reliability will set your organisation apart.

Conclusion

As great as these technology advancements have the potential to be, none of them can work on their own. Collaboration and integration is key to seeing measurable success in improved customer retention, increased efficiency, and better on-time performance.

Communication and data sharing between the shipper and the carrier is the first step to achieving real-time visibility. The level of data sharing the chemical company needs and the level that the carrier is willing to share should be discussed, but compromise and communication at this stage is critical.

Once you possess the real-time integration data you need, the next step is to integrate it properly within your system. Find a company who will customise an upgrade or help

overhaul your ERP or TMS that will seamlessly allow for real-time visibility to be integrated within your decision-making process.

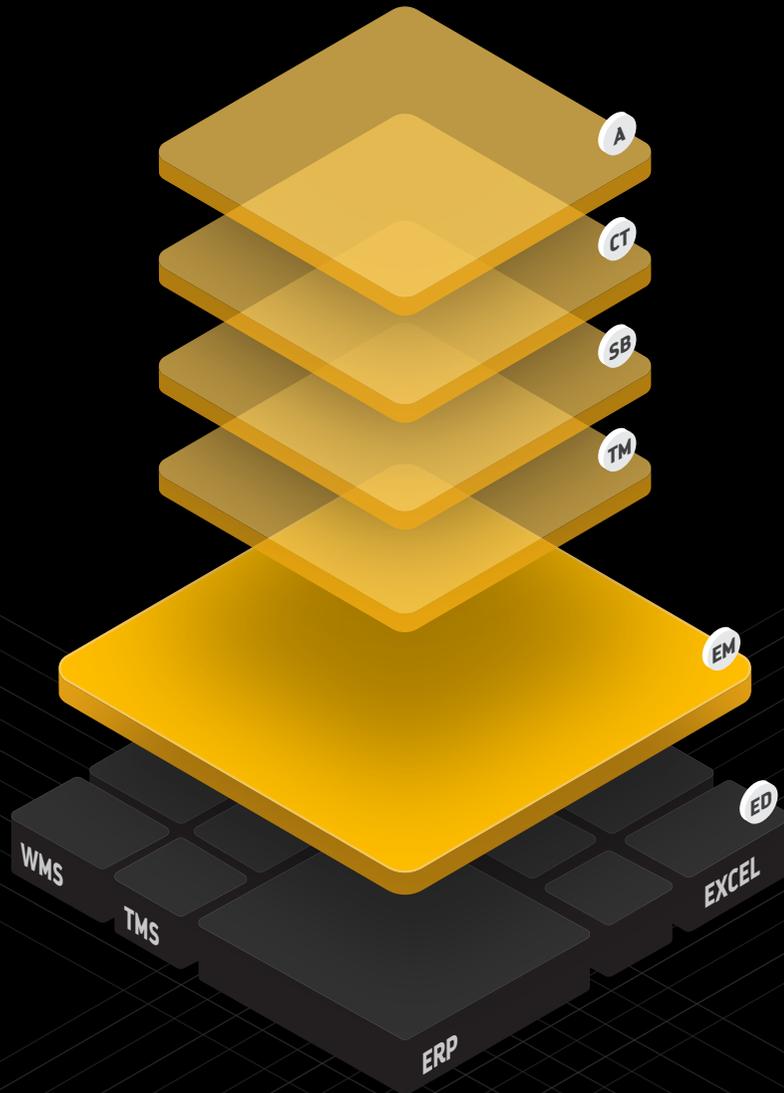
Using a fully-integrated system to its full advantage becomes the next challenge for any organisation, but begins the process of seeing true benefits throughout the supply chain. Encouraging company-wide collaboration within the system will help to remove departmental silos and allow for any employee to see and act on the information they need.

As soon as this information is available to your employees, the next and final step that will provide added-value to your organisation is to offer this same visibility to your customers. When customers can see this transparency throughout the

process, the roles of your employees become proactive and strategic instead of reactionary to daily problems. This shift will help take the mystery out of your supply chain and keep your customers loyal.

Keep an eye out for our next white paper in the coming months, titled “Real-Time Visibility: The Carrier’s Perspective.” We'll dive into some of the issues covered on slow adoption rates and challenges in data-sharing, and provide solutions for how carriers and shippers can more effectively work together.

We are also organising a second **roundtable event on 25 April, 2019**, where we will be releasing the results of a current survey and our **“Steps to Achieve Real-Time Visibility”** checklist.



Compose your own **Technology Stack**

Technology Stack

- A** **Analytics**
Carrier & Supplier Performance, KPI & Dashboard
- CT** **Control Tower**
Shipment Planning
- SB** **Slot Booking**
Advanced Slot Planning
- TM** **Transport Management**
Shipment Visibility

Base Layers

- EM** **Real-Time Event Management**
Modern API integrations
- ED** **Existing Data**
WMS, TMS, ERP: SAP, Oracle, MS Dynamics, ...

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