Harnessing the Power of Big Data

→ How to Navigate the Evolution of Logistics

If you spot a UPS truck approaching an intersection in Australia there's a 90% chance it's about to turn left.

By analysing vast amounts of data of delivery routes, traffic patterns, fuel consumption and safety records, UPS made the simple but crucial observation that turning into traffic can be time-consuming and pose a safety risk[i].

This insight enabled UPS to develop its now-famous route-optimisation strategy, enabled by a powerful software algorithm.

Instead of turning into oncoming traffic – a right-hand turn from the left-hand lane – a UPS driver will turn left, and then another left, and then another left to head in the desired direction.

10M
gallons saved

The strategy saves UPS 10 million gallons of fuel (nearly 38 million litres) and reduces carbon emissions equivalent to more than 20,000 passenger cars *every year*[ii].

No excuses

Twenty years ago, when UPS harnessed the power of data, the Australian transport industry was still fragmented in terms of technology adoption, with manual processes and paperwork the norm.

It was typical for a customer to place an order through a phone call, fax or email, and at the other end a consignment could be written on carbon copy paper. Delays, human error, fragmented data and processing inefficiencies were rife due to the manual processes.

Over the past two decades, technology has revolutionised the industry, vastly improving the quality of data and its useability. However, Australia still lags behind the world's leading economies in the application of technological tools to better utilise data to improve supply chain performance as a result of our lower population density and larger geographics.

In this paper we set out how, by collecting, analysing and utilising the data at your fingertips, you can carve out efficiency in the supply chain and gain a competitive edge.

Consolidating data is the key to unlocking its power

Data encompasses the wide array of information from throughout the supply chain – from inventory levels and shipment details to transportation metrics and customer orders.

It can originate from various sources, including Warehouse Management Systems (WMS), Enterprise Resource Planning (ERP) platforms, IoT sensors, GPS technologies, customer orders, supplier information and external databases.

However, when the diverse array of data is fragmented, there is an inherent risk of miscommunication, redundancies and inefficiencies. Integrating all data for central visibility is crucial to enhance performance and drive improvements.

Integration platforms, APIs, data warehousing, cloud solutions, standardised formats and IoT networks facilitate data consolidation.

Data as the lifeblood of the supply chain

Across every point of the supply chain information is being created at every minute, from inventory levels and shipment details to customer orders and transportation milestones.

When this information is captured, consolidated and interpreted in a timely manner by a trained, expert analyst it can be transformed into insights that empower logistics and supply chain managers to enhance operational agility and improve strategic-decision making.

Operational benefits

On a day-to-day level, data can be used to drive operational effectiveness and efficiency. Benefits include:

Customised solutions

Utilising data analytics, it is possible to **optimise delivery routes** and / or inventory strategies that align with your unique requirements.

Efficiency

Data analysis enables the identification of areas for **continuous improvement**, focused on reducing transit times and transportation costs for customers.

Inventory management

Utilising data insights can **minimise stockouts**, lower storage costs and streamline operations.

Agility

Data-driven logistics enable **rapid adjustments** in response to changing customer demands, market fluctuations or unforeseen circumstances.

‘Big Data’ for strategic improvements

While operational data enables initiatives that deliver short-term efficiency gains like the ones above, insights from ‘Big Data’ empower strategic planning, innovation and long-term improvements.

Possible applications of Big Data in logistics include:

Annual, quarterly or monthly forecasting

By reviewing previous years’ data and applying predictive models it is possible to **identify trends** and **prepare for surges** in specific routes or services to manage peaks in demand.

Risk mitigation

Predictive analytics helps **foresee potential disruptions.** For instance, by analysing data around bushfire seasons we can determine potential disruptions to routes, demand and freight costs in the event of another bushfire.

Continuous improvement

Insights from the performance analytics can be used to identify improvement opportunities including:

- **Route optimisation:** Analysis of transportation data can uncover route optimisation plans that **reduce delivery times and costs.**
- **Packaging efficiency:** Understanding how altering packaging dimensions can most **efficiently accommodate specific product types.**
- **Specialised service provider support:** Resources can be allocated more effectively, enhancing **operational efficiency** and customer satisfaction.
- **Lane consolidation:** Analysis helps in identifying regularly travelled lanes and where they can be consolidated to **optimise resource utilisation** and minimise carbon footprints.

Customer insights

Granular analysis of freight costs as a percentage of sales right down to the individual order delivers a clearer understanding of customer profiles and enables **strategic decision making** about how to innovate and adapt to market demand.

Supporting sustainability

Gathering emissions data from different carriers, modes of transport and routes and overlaying this with cost, delivery time and reliability data can inform a strategy that **minimises emissions** without comprising service.

Innovative solutions

Data analysis can uncover innovative solutions. For example, predictive analytics of inventory data might lead to the implementation of **just-in-time inventory methodologies**, streamlining stock levels and reducing storage costs.

Performance analytics

Regularly presenting reporting dashboards showcasing metrics including on-time delivery rates, inventory turnover and cost per kilometre makes it possible to **track performance** and **identify areas for improvement.**

QUICK FACT:

While data refers to any information collected, stored or processed, **Big Data** involves large volumes of diverse data types from various sources, often requiring advanced analytics and tools to extract meaningful insights

The Critical Role of the Commercial Analyst

A Commercial Analyst and a Supply Chain Analyst are both crucial in driving efficiency and competitiveness, but they are quite different roles.

When a company has a Supply Chain Analyst, the Commercial Analyst will provide them with areas of interest discerned from data insights to support their overall objectives of their supply chain.

Both analysts complement a logistics manager's operational expertise with specialised analytical skills and commercial acumen.

The Commercial Analyst

With a background in Business or Finance, and with expertise in data analysis tools and statistical software, a Commercial Analyst possesses the analytical prowess to interpret complex data and derive actionable insights.

The Supply Chain Analyst

A commercial analyst in a company's supply chain function has a broader scope, looking at end-to-end supply chain processes, including procurement, manufacturing, and distribution, and how they integrate within the company's operations.

Forecasting fuel prices to improve strategic decision making

In 2022, Russia's invasion of Ukraine led to a surge in the price of fuel, already high due to a recovering post-pandemic economy[iv]. At the end of that year, logistics managers wanted to know what to expect in 2023.

Two efm senior Commercial Analysts dedicated two months to reviewing the data of the terminal gate price over time. They identified trends and the key disruptive factors that led to fluctuations and overlaid that data with carrier fuel trends.

Upon reviewing forecasts by leading economists, they inferred that the terminal gate price was anticipated to range from $1.80 to $2.10 before regressing to $1.90. Subsequently, they scrutinised historical data when the terminal gate price stood at $1.90, considering the environmental context of each occurrence.

These insights informed our conversations with customers about what we anticipated to see in the market, enabling them to make better decisions for the year ahead.

Benchmark your performance

Let's say your average cost per consignment is $10 – is that a lot? Or you're raising 40 customer service enquiries for every 1000 consignments – could that be improved?

Benchmarking your performance against the industry provides crucial context for performance evaluation.

For instance, if your average cost per consignment is $10 and the industry average is $9, you might be spending more than you need to, and will focus on efficiency initiatives to reduce it in line with the market.

Similarly, if your industry peers receive only three customer service enquiries for every 1000 consignments, while you're receiving 15, there is clearly an opportunity for improvement.

Without this perspective, it's challenging to assess where your competitive advantages – or disadvantages – truly lie.

Two efm senior Commercial Analysts dedicated two months to reviewing the data of the terminal gate price over time...

Securing sensitive information

In logistics, data security is paramount due to the sensitive nature of the information.

Securing customer information, inventory records and supply chain information is crucial to prevent breaches, protect intellectual property, maintain customer trust and comply with regulations like General Data Protection Regulation (GDPR).

To optimise your data security consider the following:

Encryption and access controls: Implement robust encryption methods for data transmission and storage. Use access controls to limit data access to authorised personnel only.

Regular audits and updates: Conduct routine security audits to identify vulnerabilities and update systems regularly to patch any potential loopholes.

Employee training: Educate employees about best practices, emphasising strong passwords, phishing awareness and secure data handling procedures.

Backup and recovery plans: Establish secure backup systems to prevent data loss in case of breaches. Develop comprehensive recovery plans to minimise disruptions.

Compliance with standards: Adhere to industry-specific standards and regulations to guarantee data protection and maintain trust with customers and stakeholders.

Ensuring the security of your external provider

Organisations need logistics providers with security as a top priority. As a critical business partner, they must have extensive measures in place to safeguard from an attack, as well as the ability to identify threats in real time, limit exposures, enable business continuity and prevent future attacks.

To find out about the many security measures we have in place for our proprietary technology platform please contact us at **efmlogistis.com.au/contact**

The future of data in logistics

Driven by the emergence and convergence of advanced technologies like AI, Internet of Things (IoT) and 5G connectivity, technological change is accelerating rapidly.

Some of the anticipated developments expected over the coming years are:

Enhanced predictive analytics

Real-time predictions and increased granularity will enable precise insights, while the integration of AI will automate decision-making, allowing for faster, more informed actions.

Real-time tracking and visibility

Enhanced IoT devices with 5G connectivity will offer precise, continuous tracking, enabling not just location updates but also detailed condition monitoring (temperature, humidity) and predictive insights (expected delays or route optimisations) in real time.

Optimised route planning

Advanced AI algorithms combined with real-time data from IoT and traffic sensors will dynamically adjust routes instantly, considering not just traffic but also weather, road conditions, and unforeseen events, achieving unprecedented accuracy and efficiency.

Customer personalisation

Advanced AI and machine learning algorithms will process real-time data streams, enabling immediate adjustments to logistics strategies, providing hyper-personalised services and anticipating customer needs before they arise.

Autonomous vehicles and drones

There will be widespread use of fully autonomous vehicles and drones equipped with advanced AI, capable of handling complex delivery tasks, navigating various terrains, and adhering to stringent safety regulations.

Dynamic inventory management

AI models powered by big data will predict demand with higher accuracy, considering more variables, enabling agile supply chains that adapt instantly to changing market dynamics.

Warehouse automation

While it is now common practice for warehouses to employ robotics for tasks like picking and sorting, more sophisticated AI-powered robots and drones will handle complex tasks, collaborating seamlessly with human workers.

Ensuring success now and into the future

It is crucial to take certain steps now to adapt to these emerging trends to remain competitive and sustainable into the future.

Follow these steps to optimise your use of data and future-proof your logistics:

1

Assess current capabilities

- **Identify gaps:** Assess technological infrastructure, operational processes and data handling capabilities to pinpoint areas that require improvement.
- **Evaluate scalability:** Determine if current systems can scale with business growth and meet future demands, ensuring they remain adaptable and efficient.

2

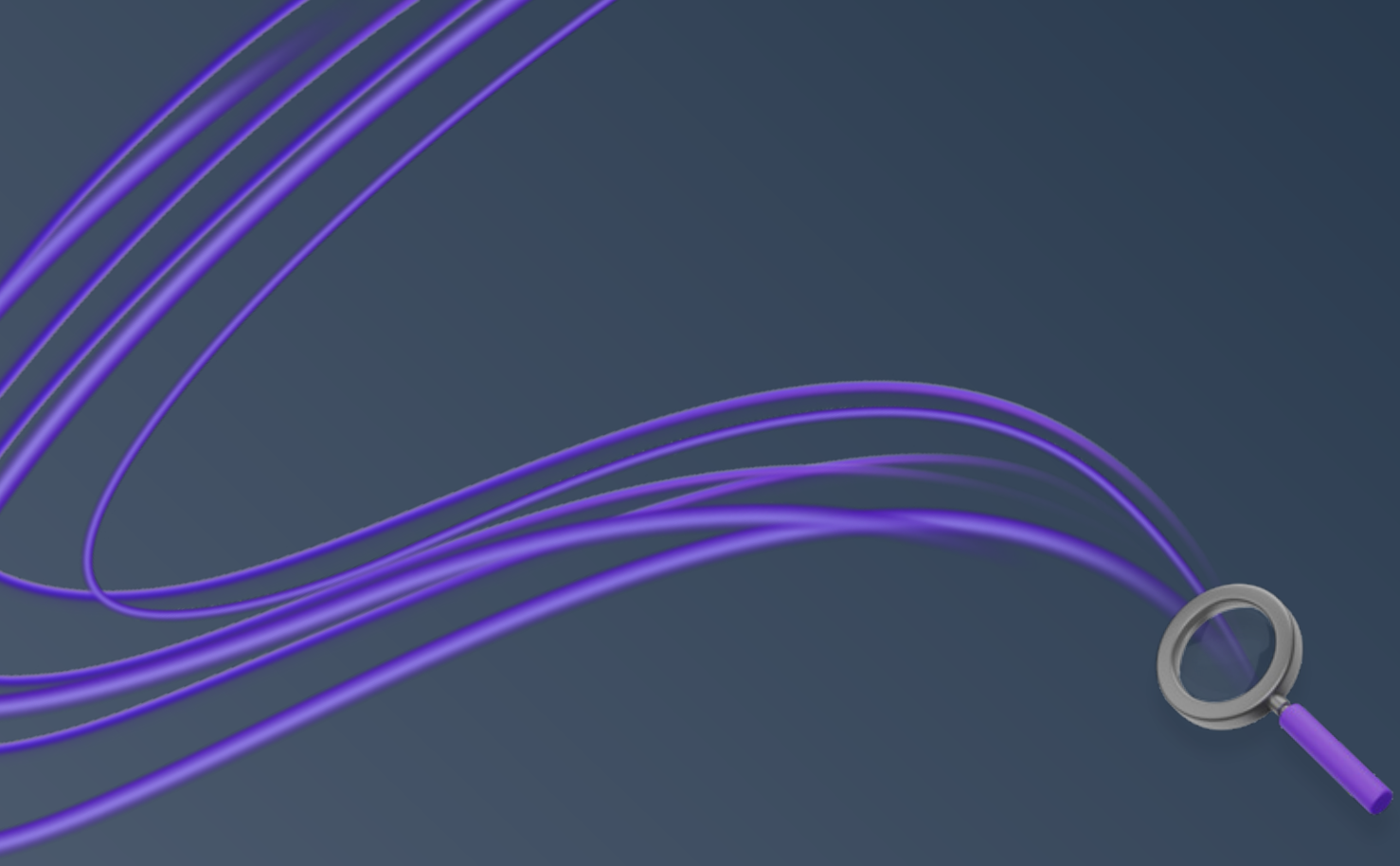
Invest in advanced technology

- **Strategic investment:** Invest in technology or partner with a provider with solutions that offer scalability, flexibility and innovation.
- **Prioritise integration:** Choose technologies that integrate seamlessly with existing systems to avoid disruption and maximise efficiency.

3

Develop data-driven strategies

- **Data collection and analysis:** Establish robust mechanisms for data collection, storage and analysis, aiming to derive actionable insights for strategic decision-making.
- **Cultural shift:** Foster a data-centric culture within the organisation, encouraging employees to make decisions based on insights derived from data analysis.



Data serves as the linchpin for informed decision-making, operational efficiency and in enabling strategic advancements in a logistics function.

When collected from across the supply chain and consolidated into a central platform it provides end-to-end supply chain visibility which has the potential to drive efficiency, foster innovation and create competitive advantage.

To find out how efm can optimise your use of data, please contact us at **efmlogistics.com.au/contact**

References

[i] https://edition.cnn.com/2017/02/16/world/ups-trucks-no-left-turns/index.html#:~:text=UPS%20trucks%20almost%20never%20take,to%20over%2020%2C000%20passenger%20cars.

[ii] Ibid

[iii] https://www.infrastructure.gov.au/sites/default/files/documents/freight_data_requirements_study_final_report_v2.1.pdf

[iv] https://www.statista.com/statistics/1326377/impact-of-the-russia-ukraine-war-on-average-wholesale-fuel-prices/