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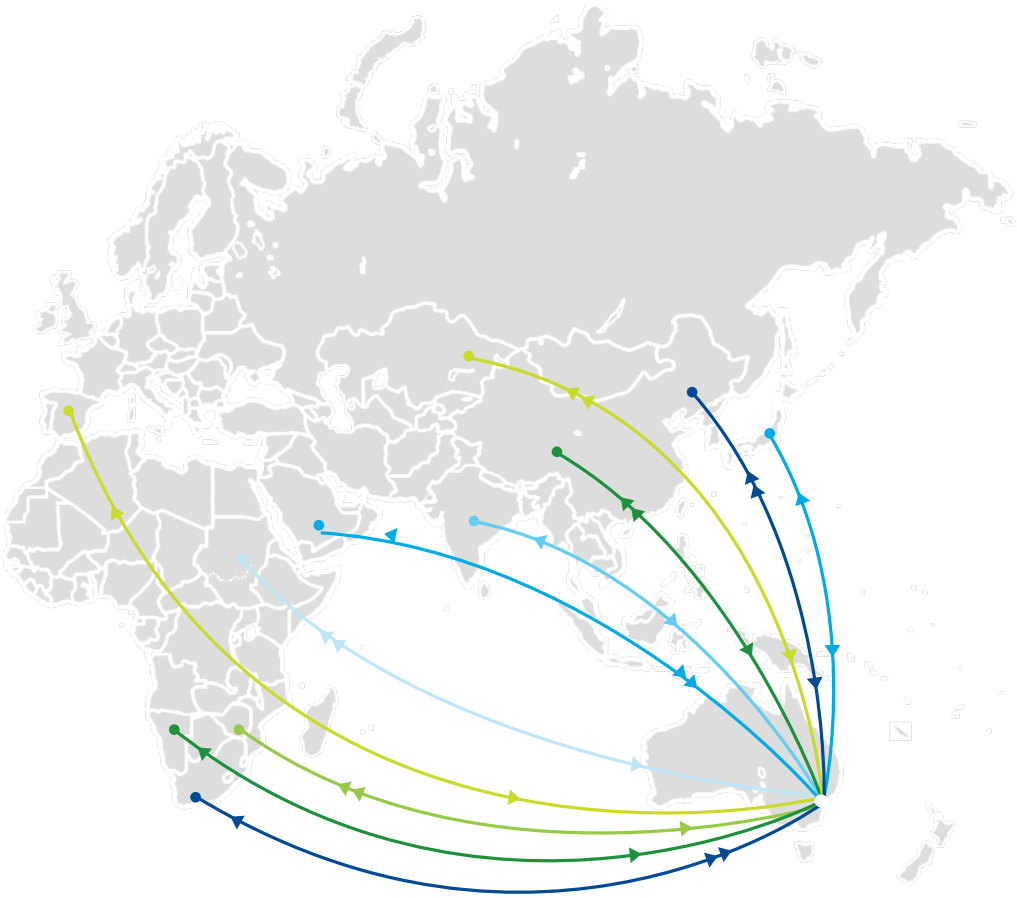
Optimising business operations
Supply chain simulation uncovers value



As layers within your business operations grow, true visibility across the chain diminishes

Today's supply chains are highly complex: often spanning multiple continents and involving a large number of third party vendors, each with their own unique performance characteristics. This has coincided with an increased focus on integrating supply chain functions and information, particularly in industries such as retail, transport and energy and resources.

If left unchecked, these complexities within supply chains can result in significant production delays, high costs and ultimately poor customer service – directly impacting profitability.

Supply chain simulation, analysis and visualisation can provide organisations with a significant competitive advantage. Organisations now have the opportunity to build, test and analyse several scenarios simultaneously to create true optimisation for their supply chain.

Using simulation to obtain operational insights

Data simulation bridges the gap between historical analysis and 'what if?' scenario testing, allowing clients to run the supply chain through a range of different scenarios.

- Simulation can be used to optimise existing operations within current operation configurations
- Understand the benefits and drawbacks of alternative supply chain configurations
- Model the financial impact of changing key operational levers.

Deloitte Consulting utilises data visualisation and predictive modelling techniques to reduce the length of time that senior executives spend analysing the vast amounts of information, to make critical decisions about changes to their company's supply chain. Visualisation allows users to observe the effects of large amounts of data on their supply chain operations on a single visual map.

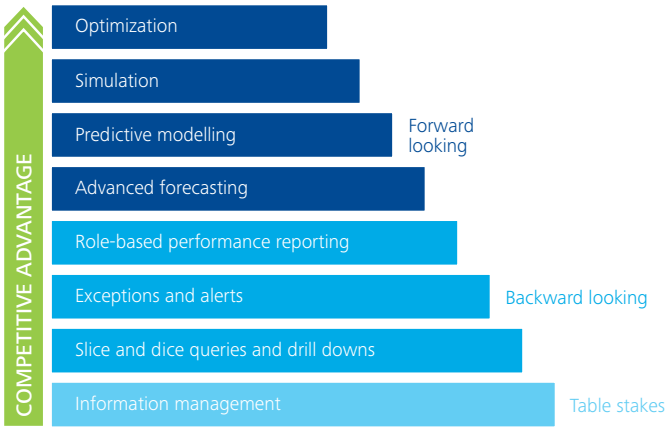
Data is presented across the dashboard using key indicators directly related to the company's goals, therefore ensuring decisions can be made in a timely manner.

Compared with traditional spread sheet presentations, the data in the graphic provides an improved understanding of the underlying numbers.

Directly tying simulation results to profit & loss (P&L) outcomes allows the business to manage risk by running impact analysis on negative outcomes, and identify the keys to success leading to positive financial outcomes. Data simulation is also flexible by nature, and can be incrementally added to over time, as benefits create a self-funding simulation capability. Organisations can frame problems and test hypotheses instead of waiting for the end result, allowing management to make smarter, more forward-looking decisions.

Client example: Production Visualisation

We have implemented a complete supply chain visualisation solution demonstrating key operational metrics in near-real-time for a major mining company. This solution is displayed across multiple large screens and was built using leading business intelligence and data warehouse technology.



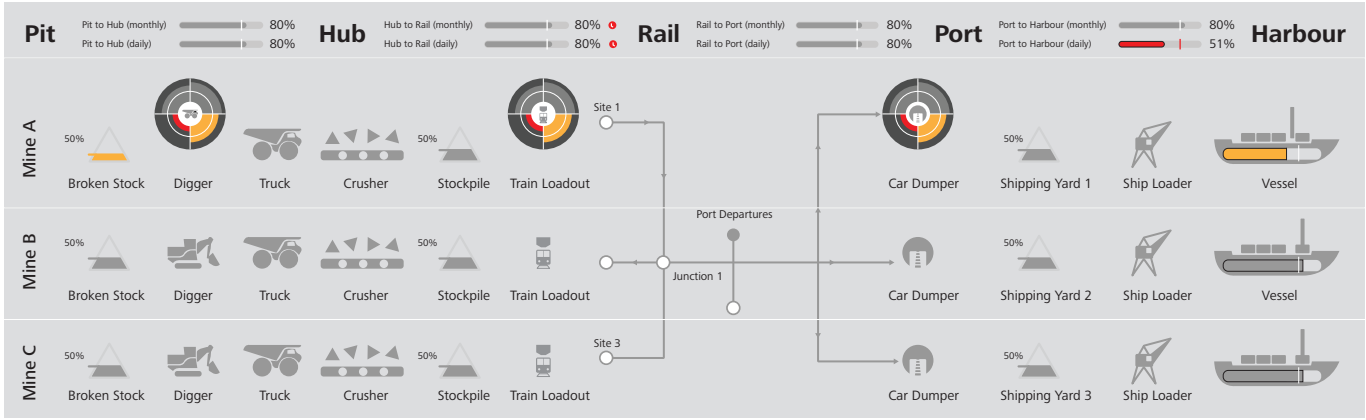


Figure 1, near real-time visualisation of operations

Current operations information is linked directly to a Value Driver Tree (VDT) which simulates a P&L outcome in real real-time. By linking the asset level visualisation in the tool, to a VDT front-line operations employees are continually making operational decisions which optimise the P&L outcomes.

By understanding the range of outcomes, operational decisions can be made on the basis of likely outcomes and expected costs – rather than based on intuition and partial views of the end-to-end supply chain.

Client example: Demand forecasting through agent-based simulation

The client challenge

Peak network demand for energy has increased, in a complex and difficult to predict patterns. This is largely due to the growth of populations (in-fill and green-fields), and the proliferation of more energy hungry appliances in the home.

Rapid growth in urban areas often wasn't communicated with enough advance warning and specific detail, to aid the development of network infrastructure development initiatives (such as the addition of new transmission lines and substations).

The solution

Our simulation output has now generated several strategic data assets of network demand and the identified drivers for a series of years into the future at a granular level of geography (400m × 400m).

These outputs now act as the cornerstones of discussions with the regulator around funding for network development and maintenance.

Our client can now forward plan land purchases and network upgrades, and in a fierce employment market can proactively search for relevant skills well in advance of requirements to ensure they can keep pace with demand for new connections and maintenance in growth areas.

Client example: Manufacturing build time optimisation

The client challenge

This client is a leading aircraft manufacturer who was experiencing the following challenges:

- Poor on time delivery performance despite expediting parts from internal/external suppliers
- Significant inventory investments made with little yield in throughput improvements
- Increasing program costs and inability to capture contract performance incentives
- Functional scorecards indicating high levels of performance that were not translating into customer satisfaction.

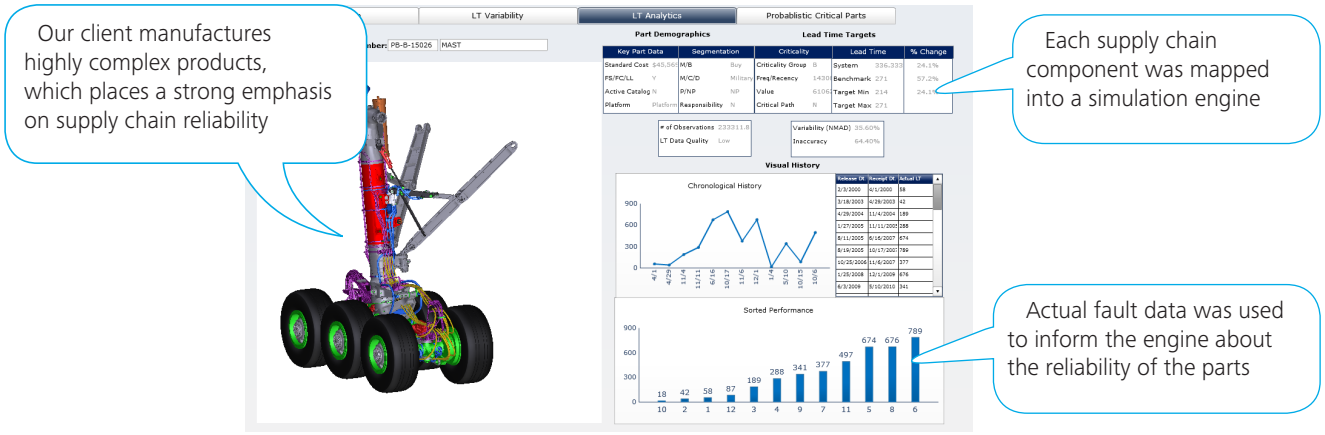


Figure 2

Client results and outcomes

By visualising the build process and clarifying the parts distribution model, to identify bottlenecks and process breakdowns the client saw earnings before interest and tax (EBIT) improve by 100% within three years. Tracking to an annualised run rate of 70% of expected savings at the end of year one.

The solution:

The critical challenge for our client was in developing a common source of truth for service performance, as well as understanding the impact of changes they could make to their supply chain. As such, we developed a single source of data for the end-to-end manufacturing process which formed a clear baseline.

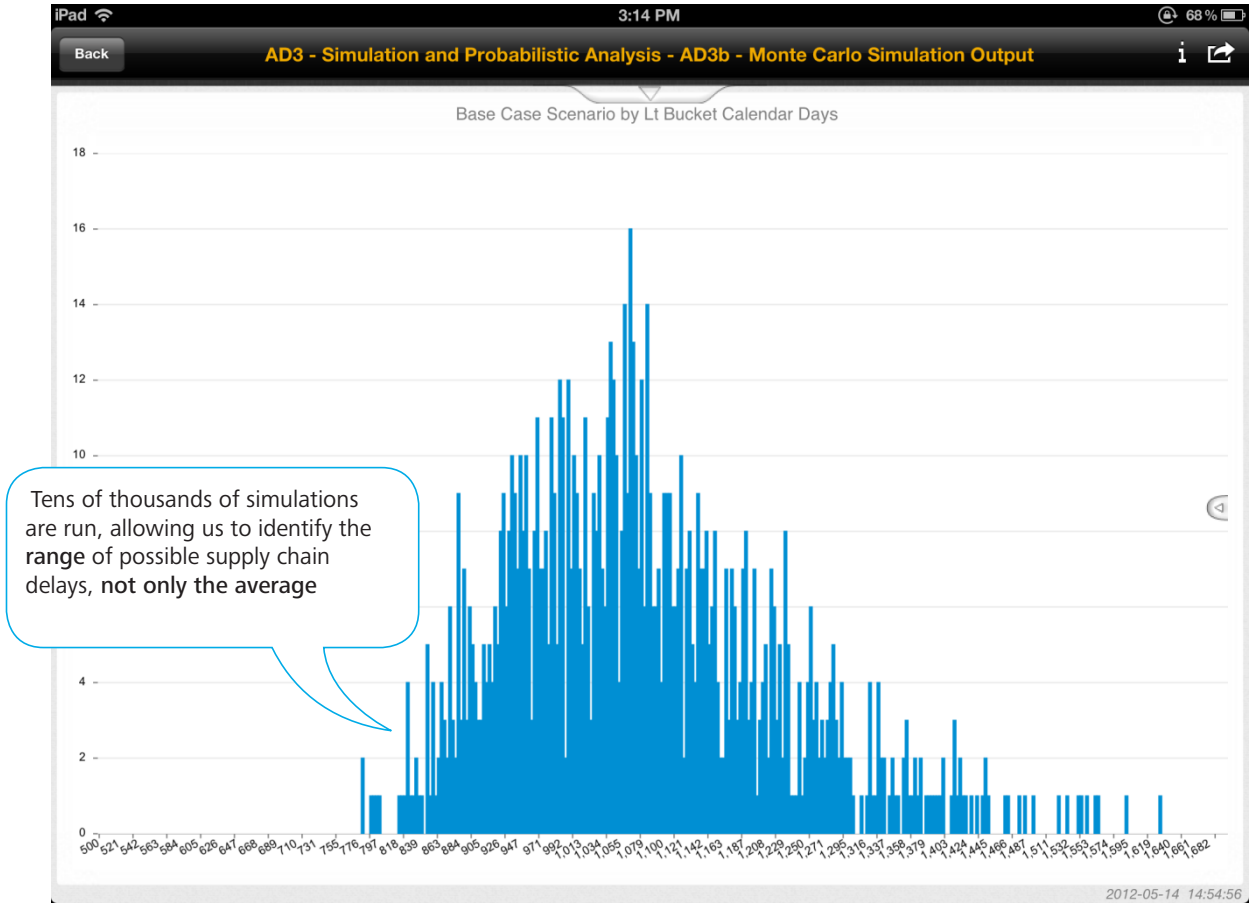
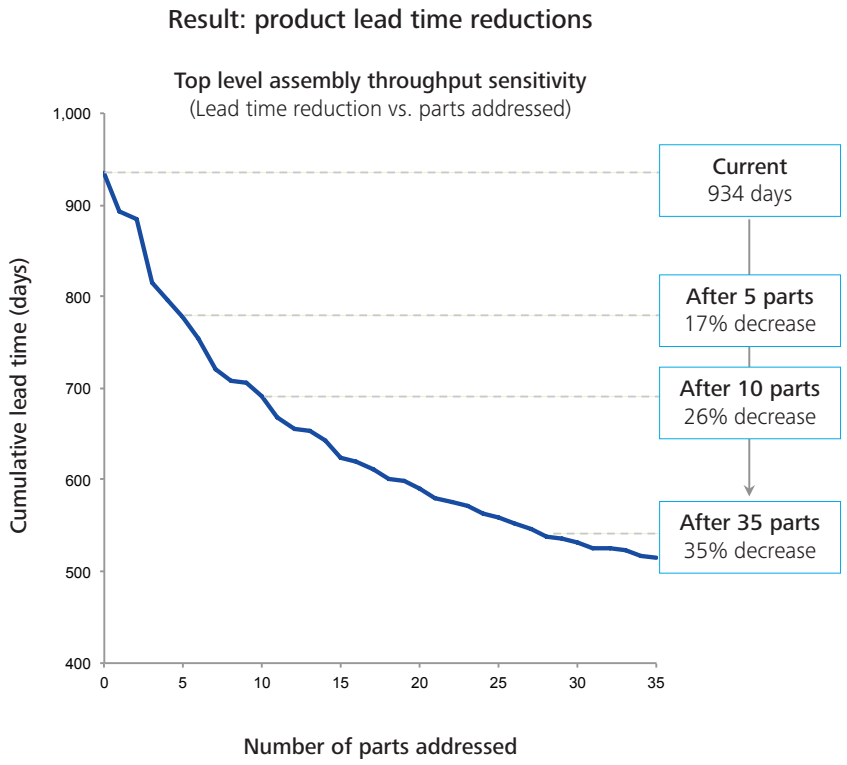


Figure 3

Client results and outcomes

This baseline was used to form hypotheses around the specific parts and elements of the build process that needed to be changed. By running the supply chain under a broader range of scenarios, using a business simulation approach, we were able to identify the specific parts and actions that would lead to a significant reduction in cost, while dramatically improving service. Most importantly, we were able to prioritise the process changes which had the greatest marginal benefit, resulting in low risk and strong buy-in from the operations team.



- Over $100m in cost reductions through reductions in contract penalties, working capital, process efficiencies etc.
- 35% reduction in product lead time
- 12% reduction in un-utilized capacity
- 20% reduction in inventory holding costs
- 35% increase in schedule stability (lower variation)
- 45% increase in on-time-delivery
- Improved MRP data quality (and management practices)
- Improved organizational alignment (and focus on the critical issues)
- Shift from 'fire fighting' to 'fire prevention'.

Figure 4, Product lead time reductions

The single source of truth

The major benefit of using data simulation and visualisation is that it creates one single source of data, therefore uncovering potential risk and undiscovered opportunity, which leads to true optimisation of the supply chain.

To do this, the information available to management must be clear, concise, communicable and most importantly easily updatable. Effective visualisation does this, enabling users to access knowledge efficiently and effectively. The graphical presentation of information allows us to clearly understand and process larger amounts of data in a single visual map – giving decision-makers access to actionable insights. From this insight senior management are able to decide if the organisation should continue on a similar path, adjust or rearrange the sequence of projects to determine immediate impact or change direction completely.

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