

# DYNAMIC VALUE NETWORK OPTIMIZATION IN THE AUTOMOTIVE INDUSTRY

In a transformative climate, automotive players must prepare for external factors that will have long-lasting effects on the supply chain infrastructure. Discover how integrated planning and dynamic value network optimization can improve delivery performance and reduce capital costs



Big changes are happening in the automotive industry. The rise in private vehicle ownership has sharply increased demand. Climate change concerns are pressuring authorities to impose stricter limitations on carbon emissions – resulting in the need to leverage new technologies in manufacturing and automotive design. In addition, mergers, acquisitions and joint-ventures influence the integration of different logistics networks.

Supply chain network planners need to deal with unknown foreign trade risks, changes in demand patterns and product mix, as well as increasing commodity costs.

With ongoing concerns regarding import taxes on products, components and materials such as steel and aluminum, it is very challenging for them to evaluate tradeoffs for sourcing and production locations.

Additionally, supply chain network planners also need to examine the effects of these factors on profits and cost structures within the limits of relevant constraints.

External factors are changing the status quo, resulting in the need for infrastructural changes in both the manufacturing and supply chain aspects of the industry. Automotive manufacturers can no longer operate in silos – major decisions must be made by striking a balance between catering to customer needs, adhering to all regulations and achieving business KPIs – even if they change over time.

Complacency is not an option. Automotive manufacturers need to optimize value at every step of the supply chain to stay on top of the game. In this industry brief, discover:

- The limitations of legacy systems commonly used in the industry
- The benefits of a solution configured to your business reality
- How visualizing the actual planning process in a system – including visibility of all relevant planning knowledge, rules and assumptions – leads to more efficiency
- How scenario planning assists in decision-making

As customers change their behavior and demand more personalization and customization, flexibility becomes key in automotive production. The emergence of new technologies and the need to bring cars faster to the market call for updated and new processes.

To cope with increased variation and a broader product range, network planners should use a tool that can evaluate scenarios based on defined planning KPIs. It should be able to visualize the network structure while considering all constraints, rules and assumptions.

Additionally, the solution must be able to propagate and display the effects of changes and decisions across all production sites, automatically checking the availability of all resources such as materials, containers and staff.

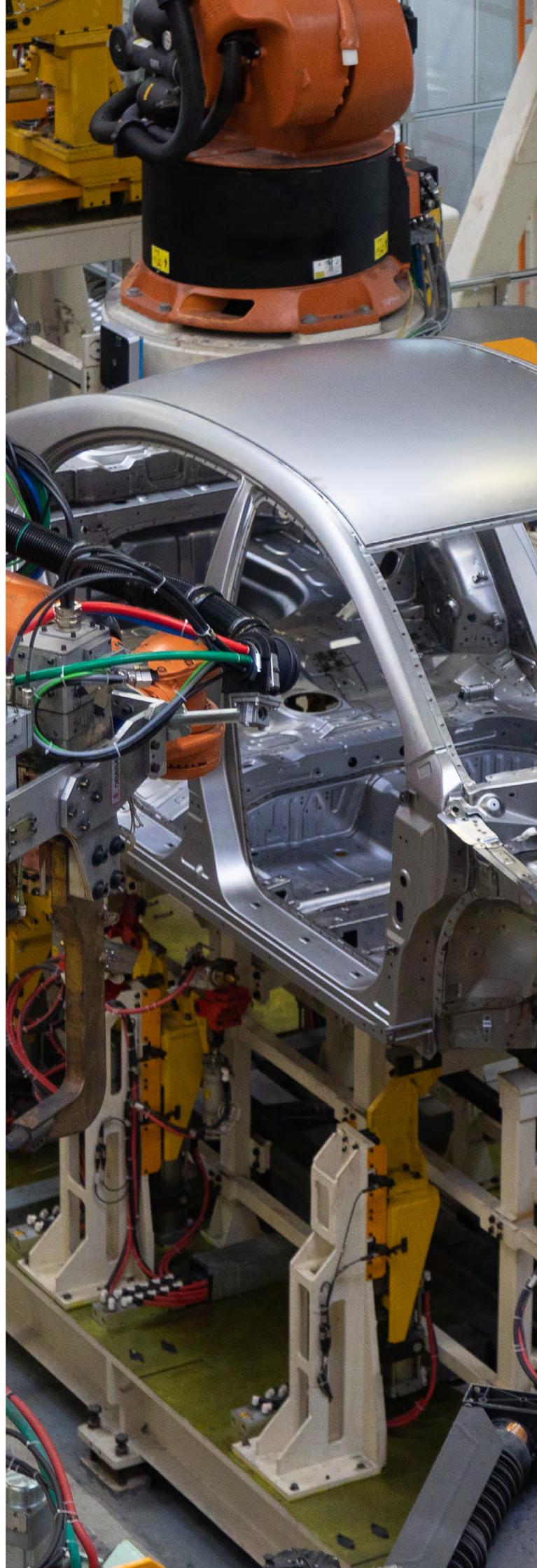
## THE LIMITATIONS OF LEGACY SYSTEMS

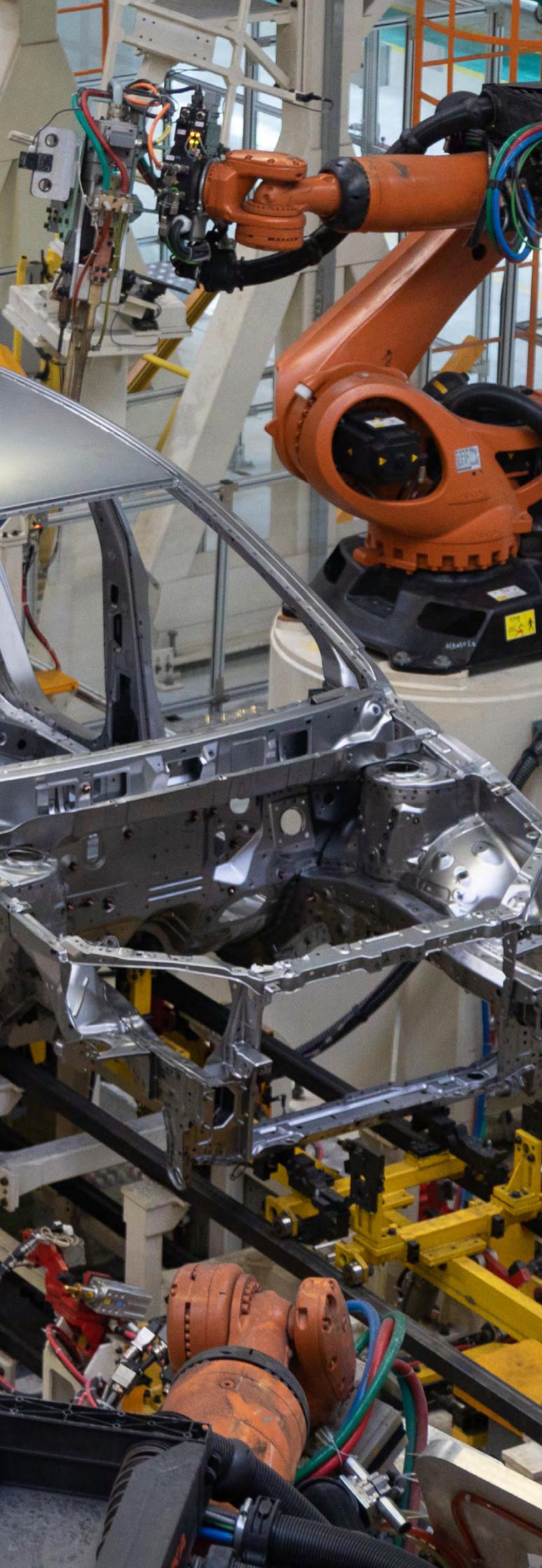
An optimized automotive supply chain network will streamline, regulate and set an ideal pace for parts production and delivery. This will result in reduced costs on the inbound network, better productivity and efficiency in manufacturing, and reduced logistics costs for vehicle deliveries.

Creating an ideal network that works in real-world conditions is extremely challenging. Specific modules and components – such as ADAS, powertrains, batteries and e-motors – typically have their own complex supply chains that need to be managed and planned within the greater assembly supply chain.

Amidst this complexity, supply chain network planning has to be agile enough to address future changes and uncertainties. However, for many OEMs, the current system landscape hampers the efforts being made to promote agility. Planning is often done on legacy systems, with input provided via manually updated spreadsheets. Data is disparate, scattered across multiple roles and granularities. Information is not used effectively.

To fully embrace the changes and complexity in the automotive industry, supply chain network planners need to implement a new way of working. OEMs and automotive suppliers must move on from legacy systems to achieve a seamless harmonization of their planning processes, tools and infrastructure. Planning consistency across all systems and geographies must be a key goal. This will enable planners to plan across multiple facilities and functional areas. Doing this will reduce and accelerate all planning efforts, thereby maximizing overall efficiency.





## THE BENEFITS OF A CONFIGURED SYSTEM

Traditionally, automotive manufacturers established supply chain footprints across the globe to reduce logistics costs, as well as gain subsidies and trade concessions. However, many of these benefits are influenced by political and economic policies, which can change – sometimes drastically – over time.

Automotive manufacturers must recognize relevant developments fast and react immediately by making adjustments to their own networks. For example, if business conditions change in one region, they can shift production to other locations. If import tariffs are imposed on materials from certain countries, they can look for a different supplier.

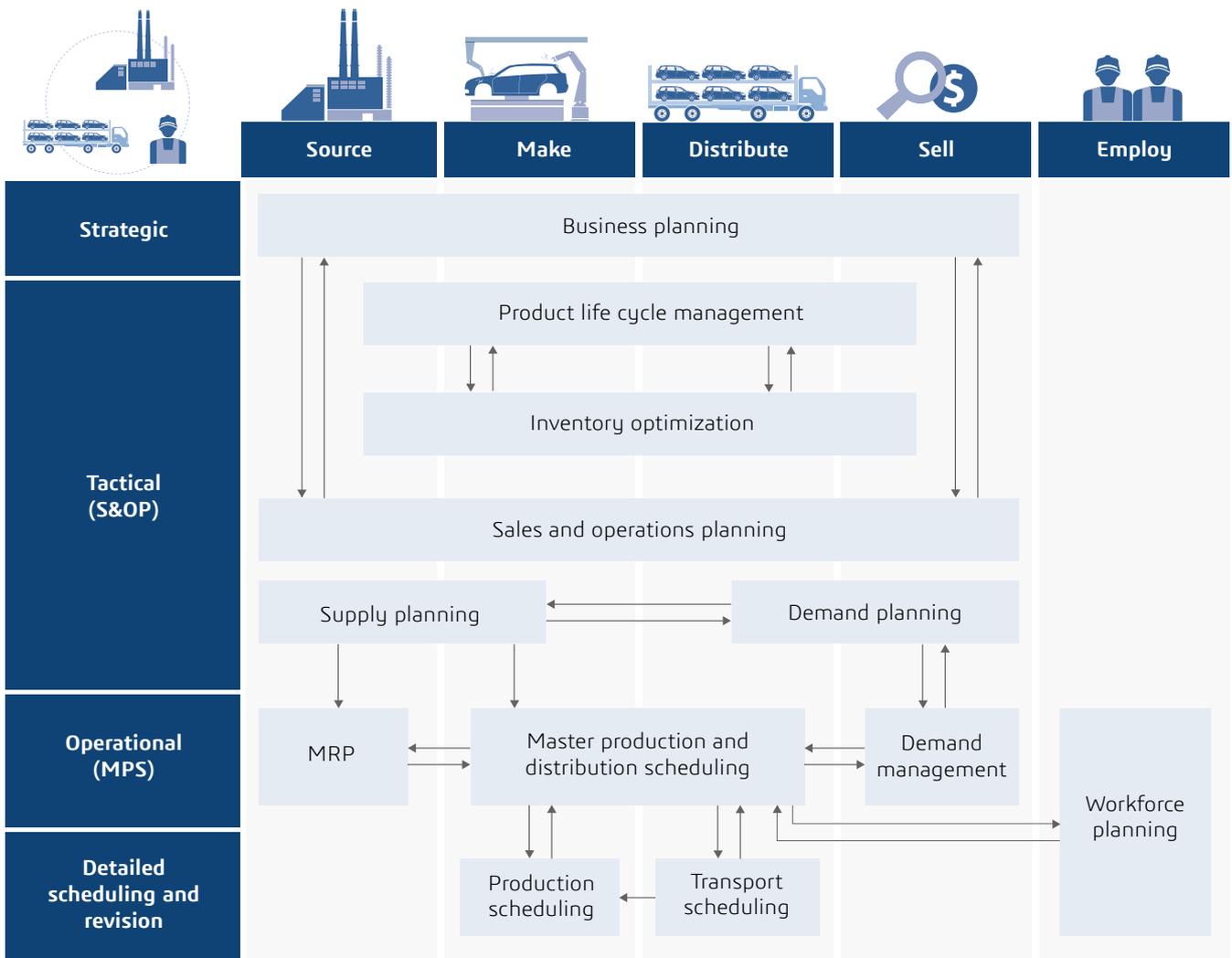
To ensure that these crucial decisions can be made quickly and effectively, the global network structure and impact of new investments must be assessed continuously. Additionally, analyses must be performed within the context of each individual business. The network planners can then assess and accurately shift the volume allocation within the network, based on considerations such as:

- Feasibility of the total car program (what can be produced and where they can be produced)
- Capacity (what can be produced, where, and in what quantity)
- Optimization of all costs involved

Cost optimization consists of several elements such as total network cost, production and purchasing costs, inventory holding costs, fixed facility costs, and transportation costs (cost of vessel sailing/cost from plants to sales market).

To make the right decisions, network planners need to measure the impact of certain planning decisions against the relevant business goals. To do this, network planners need an integrated planning system that is configured to fit the company's individual business reality.

They also need to plan across the different time horizons of the supply chain: Long-term strategic planning, mid-term tactical planning, and short-term operational and executional planning.



**DELMIA supply chain planning solution map**

Viewing the illustration from the top down, the higher-level plans provide the planning framework to lower-level plans to reach the business goals. The feedback and decisions on lower-level plans are then moved bottom-up to act as the starting point for the higher-level plans to better reflect the reality of the operations. This bidirectional feed enables the system to continuously optimize the overall plan with the latest information.

As an example, let's take a look at how recent regulation changes in China are influencing the automotive value network. The country introduced a new approach to joint venture partnerships in the automotive space. Previously, OEMs needed a 50/50 foreign and domestic ownership to operate here. China is now removing those requirements for electric vehicle makers, allowing them to establish factories without a joint venture partner.

This favorable condition encourages OEMs to increase their electric vehicle market share. Therefore, supply chain adjustments have to be made to cater for this change.

Incidents that affect the automotive value network are not limited to those that directly influence the supply chain. For example, the Suez Canal closure and Pound Sterling depreciation can also create enough impact to necessitate major changes to the supply chain network plan. The right planning tool can provide valuable support in the complex decision-making process, enabling planners to make better long-term decisions.

On the other end of the spectrum, the right planning tool can assist planners in finding the best options quickly in cases of sudden change. For example, the USA is considering imposing punitive customer duties on vehicles from certain countries to create a more favorable market for its own manufacturers. With solid decision support, planners can mitigate the negative effects of this and other similar trade restrictions.



## HOW SCENARIO PLANNING ASSISTS IN DECISION-MAKING

While a company's long-term goals are important, it is crucial that network planners understand that not all goals are of equal priority. Creating an optimal balance between KPIs, goals and actual results is essential.

Network planners should be equipped with a tool that can evaluate scenarios based on predefined planning KPIs. The right planning solution would be able to visualize the entire automotive supply chain network structure, while considering all constraints, rules and assumptions.

The solution must also be able to propagate and display the effects of changes and decisions across all production sites, automatically checking the availability of all resources such as materials, containers and staff.

It can then provide scenarios to enable network planners to see the results of any chosen path of action before committing to it, thus reducing the probability for human error. Plans are made based on the objective elaboration of a powerful system instead of the planners' subjective decisions.



## MAKE OPTIMIZED VALUE A REALITY

Supply chain network optimization is proven to deliver significant reductions in supply chain costs, and improvements in service levels. With the right solution, automotive manufacturers can gain their competitive advantage by enabling proactive evaluations and implementations of changes in response to dynamic business scenarios like new product introduction, changes in demand pattern, addition of new supply sources, and changes in tax laws.

Decision-making in a complex environment should not only be based on the planners' experience. With an optimized planning solution, all eventualities are calculated by the system. The impact of various scenarios on business value and KPIs are identified.

This enables planners to use their expertise to make the best decisions. They can also use KPIs to manage planning decisions and optimization efforts, thereby influencing how the network performs in the future.

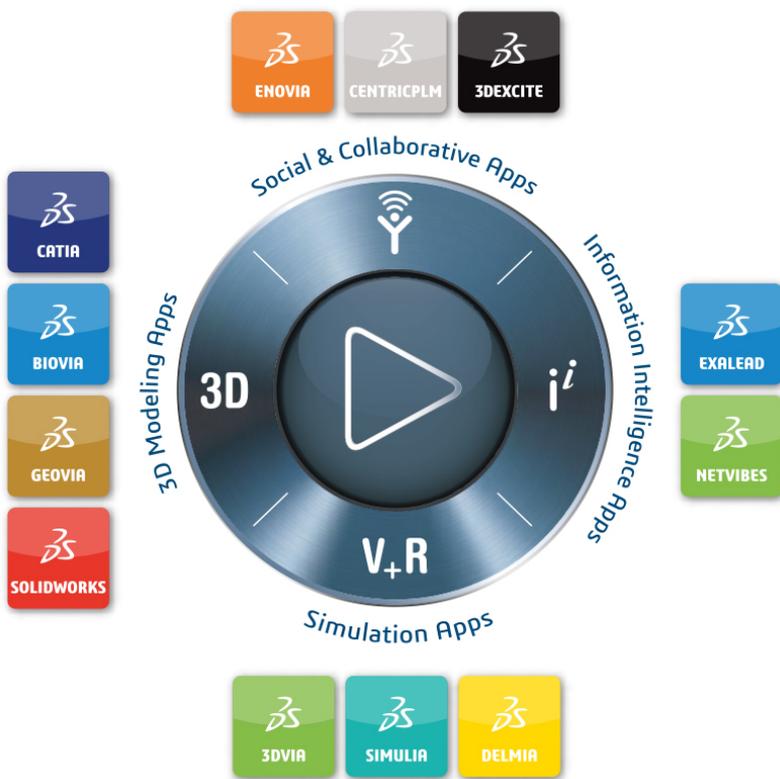


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**North America Headquarters**

1900 N. Commerce Parkway, Weston, Florida, 33326 USA Phone (954) 442-5400



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**Europe/Middle East/Africa**  
 Dassault Systèmes  
 10, rue Marcel Dassault  
 CS 40501  
 78946 Vélizy-Villacoublay Cedex  
 France

**Asia-Pacific**  
 Dassault Systèmes K.K.  
 ThinkPark Tower  
 2-1-1 Osaki, Shinagawa-ku  
 Tokyo 141-6020  
 Japan

**Americas**  
 Dassault Systèmes  
 175 Wyman Street  
 Waltham, Massachusetts  
 02451-1223  
 USA

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