

**CONNECTED RESILIENT ECONOMY
MANAGING CRITICAL
GOODS SUPPLY CHAIN**



THE CHALLENGE

One of the most visible non-sanitary impacts of the COVID19 crisis has been the huge disruption in the supply chain of goods which became critical to fight the pandemic. Masks, hydro-alcoholic solutions, and ventilators for ICUs suddenly became the most wanted commodities worldwide.

Faced with the vital risks associated with an unknown disease, populations started a rush on personal protection equipment (PPE) only to be faced with a global shortage due to: 1) insufficient national reserves and 2) the total interruption of air, land and maritime freight. At a State level, national individual strategies replaced international cooperation & assistance, thus reinforcing the phenomena.

This shortage of critical goods has raised the question about the level of preparedness of national and local governments and their ability to quickly adapt procurement strategies in the context of disrupted supply chains. **Across the globe, countries are raising the same critical questions:**

- What is our ability to early-detect the supply shortage risks?
- What level of reserves of critical goods should we secure?
- Which products are likely to be considered as "critical goods" in the event of other types of crises such as a hurricane, flooding, cyber-attack on power grids and fuel depots, continued mass protests or engulfing bush fires?
- What is our capacity to rapidly ramp-up the local production of these critical goods?



LEARNING FROM OTHER INDUSTRIES

There are some industries where securing critical goods supply has long been vital to the survival of the business and job security. In fact, in many industrial sectors, particularly those relying on huge capital and time pressure (aeronautics, defence, automotive, mining, pharmaceutical,...) managing the supply chain and planning for potential crises is as fundamental as pursuing R&D programs or efficiently managing the balance sheet.

It is our strong belief that many of the scientific methods, digital tools and processes used in the private sector to anticipate and manage potential supply crises could also be used in the public sector to prepare for the next disruptive events. A **clear visibility of critical supplies** is imperative for a resilient economy including the rapid pivoting of local manufacturing for goods. **Risk assessment capabilities** should exist across different ministries and public agencies (economy, industry, health, security, etc.) for **quick decision-making** and ensuring continued operational performance of a country and its economy. Without the ability to assess, plan and act in an agile environment, the ability to effectively address major disruptions will be strongly diminished.



THE RIGHT CAPABILITIES

What governments need are solutions that enable them to:

1. Understand and anticipate the risks
2. Define what are the critical goods that form the pillars of a resilient economy
3. Manage stock, simulate crisis scenario impact on supply chain
4. Plan for alternative supply sources and pivoting of production facilities
5. Deliver the goods to the people, even in the event of disrupted logistic routes

Fortunately, these solutions exist and should be adapted and used in "normal" times in order to switch quickly and smoothly to a crisis mode whenever needed.

HOW WE CAN HELP

With over 3 decades of experience creating such solutions for the industry, DASSAULT SYSTEMES helps 25 million industrial users across 140 countries to manage complexity and plan for the future.

Via its **3DEXPERIENCE®** platform, DASSAULT SYSTEMES can provide a digital planning, manufacturing and supply chain solution to define, plan, simulate and execute global supply chain processes in a virtual environment. It covers the entire scope and scale of Global Operations, helping governments to re-imagine their planning, management and optimization of all industrial and other public services operations, up to last-mile delivery. In addition, it allows governments to aggregate data in one place automatically, engage the right experts, simulate complex scenarios, analyze and validate options, and communicate quickly and clearly with all stakeholders.

Our team is prepared to jointly engage with Governments and public agencies to identify the needs, map and model existing systems, adapt and operate such tools.



OUR SOLUTION

The **3DEXPERIENCE** Platform – a digital planning & supply chain solution for management of critical goods and assets.



CRITICAL ASSET, PRODUCTION & RESOURCE MANAGEMENT

- Critical resource and work force planning
- Agile production capacity analyses
- Model alternative sources and substitute products
- Virtual twin modeling and simulation capability for pivot factories
- Transport & logistics planning (vehicles/warehousing)



DELIVER

- Execute operations
- Communicate with stakeholders
- Workforce scheduling
- Sourcing of material
- Transport, logistics and delivery
- Operations monitoring & Analyses
- Smart warehouse operations driven by AI
- Enable "Port-to-Door" deliveries



SUPPLY NETWORK DESIGN & MANAGEMENT

- Consolidated real-time predictive and analytical tool on critical goods availability & inventory
- Simulate crisis scenarios to understand and adapt supply chains
- Safety stock optimization
- Ability to adapt to new regulations



UNDERSTAND AND DEFINE

- Set-up real-time information stream to assess demand
- Create a trust worthy database as repository for information and analyses
- Define dependencies of critical goods to assess complexity of supply



RISK MANAGEMENT

- Understand risk of not being able to supply critical items
- Design risk management impact analyses criteria to set-up a risk management plan
- Build risk management repository and alert system
- Build critical resources repository and prediction model

1 RISK MANAGEMENT

A crisis can have many facets while the only "known" is the "unknown". Anticipating a threat can be vital. Risk management is the process of identifying possible risk or problems and utilizing risk management tools for governments to set up procedures to avoid a risk or mitigate its impact. Having built a comprehensive set of data in the **3DEXPERIENCE** platform, we can apply risk management principles to assess the degree of risk not being able to supply critical items and take necessary action. We can design risk management impact analyses criteria to set-up dynamic risk scenario planning that will lead to a living repository of critical resources, a prediction and alert system. Applying intelligence with AI driven analytics, such risk management models provide governments with **the ability to pro-actively analyze and make decisions on managing a supply chain including sourcing and manufacturing strategies.**

2 UNDERSTAND AND DEFINE

The first step is to define **all critical goods and assets and the symbiotic relationships that are imperative to support a healthy and resilient economy of a country.** This includes having a comprehensive view of their supply chain and ontology. Due to the complexity of today's global supply chain and interdependencies, setting-up a secure and live database as information repository provides the necessary means for analyses, visualizations and projections.

Using our expertise in data analytics and artificial intelligence, we empower the **3DEXPERIENCE** platform with the ability to deal with almost any kind of data sources (internal or external, structured and unstructured). The data is accessible under one single platform and decision-makers can perform cross-domain analysis (supply, demand, sourcing, and dependencies), obtain and provide live and real-time updates across time (past, present, future). Being able to collect and understand data is fundamental for all next steps.

3 SUPPLY NETWORK DESIGN & MANAGEMENT

Once the database has been set-up to define critical goods and assets while having applied best-in-practice risk management models, the **3DEXPERIENCE** platform enables governments to design new supply networks or adapt existing ones. The availability and inventory of critical resources can be reviewed, assessed and reevaluated with a consolidated real-time analytical tool. The **3DEXPERIENCE** platform can simulate and visualize different crisis scenarios in order to better understand, adapt and manage the entire supply chains from sourcing to manufacturing and distribution. This allows for **improved localization and optimized safety stocks of critical goods and assets.** The system also allows the **integration of new regulations that can have an impact on moving and storing any goods.** The ability to manage and control the holistic and complex view of dynamic supply chains with real-time data helps public authorities monitor the entire supply network.



4 CRITICAL ASSET, PRODUCTION & RESOURCE MANAGEMENT

Following the assessment and establishment of the supply network, there is a need to also evaluate and plan for **agile production, work force planning, infrastructure and logistics capabilities.** Understanding **bottlenecks and alternative scenarios** in such dynamic international environment will be key. With the **3DEXPERIENCE** platform, we provide various planning scenarios that are able to perform agile production capacity analyses, model alternative sourcing strategies and define substitute products. This entails a **virtual twin modeling and simulation capability for pivot factories.** Lastly, transport & logistics planning can be designed or optimized and quickest last mile delivery (vehicles/warehousing).

5 DELIVER

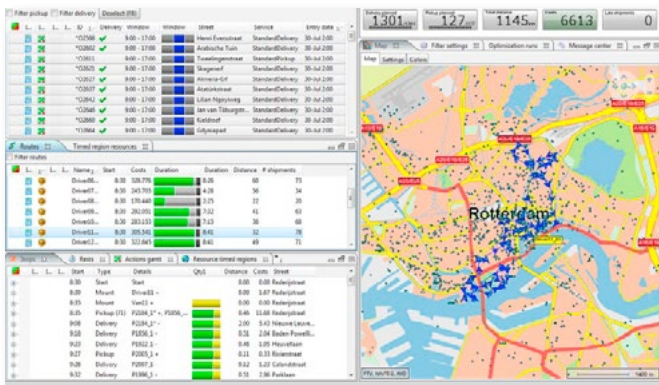
Finally, governments are able to put everything with the **3DEXPERIENCE** platform in motion and **dynamically control a complex supply network of critical goods and assets.** Covering the entire supply chain, from sourcing to design, from production to distribution, from storage to the enablement of **"port-to-door" deliveries.** **3DEXPERIENCE** platform allow for operational workforce scheduling in addition to a control tower for transportation, logistics and smart warehouse operations driven by AI. A full-scale operations monitoring and analyses capability complements the design, planning and projection aids in the system. Being able to simulate, design and manage the full product-life-cycle of a critical good or asset, the **3DEXPERIENCE** platform fully embraces today's circular world and goes beyond using critical goods with embedded processes to re-use or re-cycle goods and assets if desired.

DIRECT BENEFITS FOR ORGANIZATIONS

The **3DEXPERIENCE** platform digital manufacturing and production solution for dynamic supply chain management provides a variety of key benefits to ensure a connected resilient economy and crisis readiness:

The ability to collect and handle large-scale sets of data for analyses, simulation, visualization, 3D virtual modeling and AI driven analytics across supply and production networks.

- ✓ Enabling effective multi-stakeholder collaboration across many disciplines in a safe, secure and dynamic environment to make fast and science based decisions
- ✓ **Full supply chain simulation, genealogy and management capability including embedded circular economy action plans**



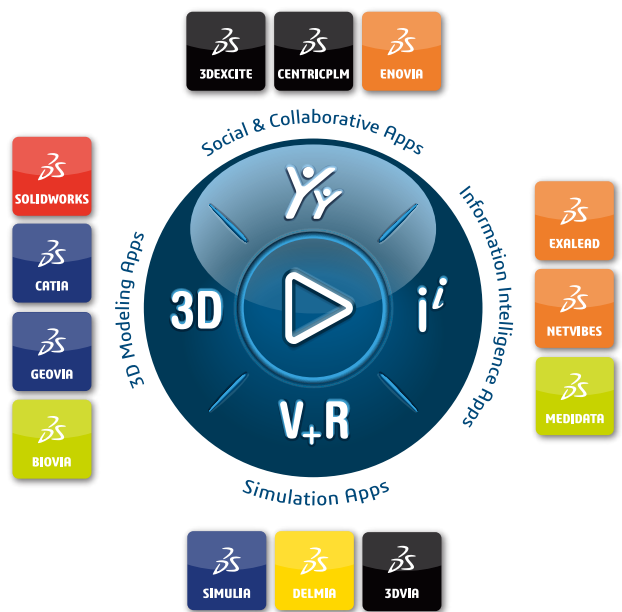
- ✓ **Rapid and agile platform deployment in a sovereign environment** varying from international to local supply chain management, from crisis management to long-term policies implementation
- ✓ Ability to engage and communicate real-time with all stakeholders involved in crisis management
- ✓ Utilizing the **state of the art digital secured cloud technology with ability to deploy in sovereign territory, with necessary cyber security certification**, covering the supply network from defining critical parameters, risk management, design of optimized supply chain, resource management for agility and excellence in operations
- ✓ **Applying a secured 3 layer authentication protocol, allowing easy management of access rights according to the people in charge**

With a state of the art and constantly evolving digital technologies such as the **3DEXPERIENCE** platform, governments can make a big step forward being prepared for the next crisis. **Being able to act rather than react will give governments the confidence and ability to better serve their citizens and build a resilient and sustainable economy.**

Our **3DEXPERIENCE**® platform powers our brand applications, serving 11 industries, and provides a rich portfolio of industry solution experiences.

Dassault Systèmes, the **3DEXPERIENCE** Company, is a catalyst for human progress. We provide business and people with collaborative virtual environments to imagine sustainable innovations. By creating 'virtual experience twins' of the real world with our **3DEXPERIENCE** platform and applications, our customers push the boundaries of innovation, learning and production.

Dassault Systèmes' 20,000 employees are bringing value to more than 270,000 customers of all sizes, in all industries, in more than 140 countries. For more information, visit www.3ds.com.



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