SOLUTION BRIEF / FUTURE-PROOF SUPPLY CHAINS

Supply Chain put to the test:
How future-proof and green is your supply chain?
Scientific calculations deliver well-founded answers to all strategic questions

Do you know the geopolitical weak points in your supply chain? Do you know at which points CO_2 can most effectively be saved? Does your supply chain comply with the new Supply Chain Act? The answers to these can be precisely calculated with an established scientific method – in just 3 months. Talk to us!

What if...? How to make the right strategic decisions? What change in your supply chain has what impact – whether planned or unexpected? What measures have the greatest effect on optimising your supply chain? With regard to

- **"Tear-resistance"** #war #pandemic #environmentaldisaster #skillsshortage
- **Sustainability**. #energyconservation #CO2reduction #savingresources
- **Law-abiding** #SupplyChainAct

Protect your strategic decisions!

More future security and less CO_2. We help you to gain a comprehensive understanding of causes, interactions, effects and connections, and thus of all the positive and negative influences on your supply chain. With the use of a tried and tested mathematical method, the impact of every change can be precisely calculated – whether it be your own planned measures for decarbonisation or external influences such as floods or drought.

Green supply chain with "mathematics twin". Only by using realistic what-if scenarios solid decisions can be made about the measures which are most effective for decarbonisation. Our digital twin, which - unlike conventional digital twins - does not work with AI but with mathematics, is used to accurately map reality. The basis for the precise calculations of the effects of internal and external changes in your supply chain is the patented X-ACT algorithm, with roots in science: it was developed in the 1970s as part of a NASA project and has been perfected in hundreds of practical applications to this day.

Supply chain optimisation with mathematical precision
Let the impact of modification measures be precisely calculated and thus make the right strategic decisions - for lower costs and more competitive power.

La Poste saves over 100 million euros with X-ACT

The company twin generated with X-ACT shows all components and dependencies of the supply chain – and therefore potential sources of errors and causes of bottle necks. The French postal service provider benefitted enormously from this:

High cost saving. Thanks to X-ACT, La Poste knew exactly what impact its planned measures to redesign its transport and delivery routes would have. A key finding of the algorithmic calculations was that sorting centres could be reduced by 30 percent. The result: Savings of around 120 million euros.

"Greener" supply chain. La Poste has achieved another major advantage in relation to sustainability: With X-ACT, it became clear what the impact would be if there were no more transport aircraft on the go – while still maintaining consistently high delivery quality and adhering to all SLAs: The CO_2 emissions fall by almost 20 percent. Meanwhile, reality has confirmed this projection.

"As consumer demands for postal services evolve and competition intensifies, X-ACT has helped our organization make strategic decisions that net cost savings without impacting the quality of services we are committed to preserving."

Alain Roset, President of Mail, La Poste

- The fourth-largest national postal service worldwide
- 15 billion mail items per year
- > 17.000 post offices

This is how the "Mathematics Twin" works

Pro-actively calculate rather than retrospectively analyse. In contrast to digital company twins that are based on AI or big data, a business model created with mathematics works without data from the past. Instead, dependencies and interactions are described mathematically. Consequently, only information regarding infrastructure and processes is required, e.g: How many and which transportation vehicles are there? Historical data such as a tachograph is not needed for the calculations.

- **1. Create a mathematical model.** With mathematical descriptions and the exact circumstances of your company, a digital company twin is created.

- **2. Calculate a model using an algorithm.** Through stress tests and what-if analyses, X-ACT identifies everything that impairs or improves your supply chain.

Precise planning. With X-ACT, the outcomes of every scenario can be calculated. Parameters such as demand, costs, lead times and production yields are easily changed independently to understand the cumulative impact of variations on the entire supply chain. With these findings, you can create targeted plans to optimise your supply chain. In each case you will know exactly which improvements you can expect and when – whether it be in relation to costs, CO2 emissions, dependencies or legal compliance.

Dreams of the future?

The Ministry of Economics is thinking aloud about extensive requirements for German companies that trade with China. For example, an ntv report from the 1st of December 2022 revealed that it is to be examined whether "regular self-imposed or, where appropriate, mandatory stress tests should be carried out [...]. The reference scenario should 'simulate the elimination of business with China or of supplies from China'."

https://www.n-tv.de/wirtschaft/Habecks-Ministerium-will-China-Geschaeft-drastisch-eindaemmen-article23757515.html

Don't wait! Check with X-ACT what happens regarding China when …

Repair, Optimize, Transform –
we accompany you on your way to success

With over 50 years' IT and process experience across all industries, we ensure that X-ACT also provides valuable results in your company within a very short time - for more supply chain performance and resilience. You too can rely on the high level of expertise of the URM Group's only implementation partner in Europe. Here is an overview of our approach:

1. Consultation.
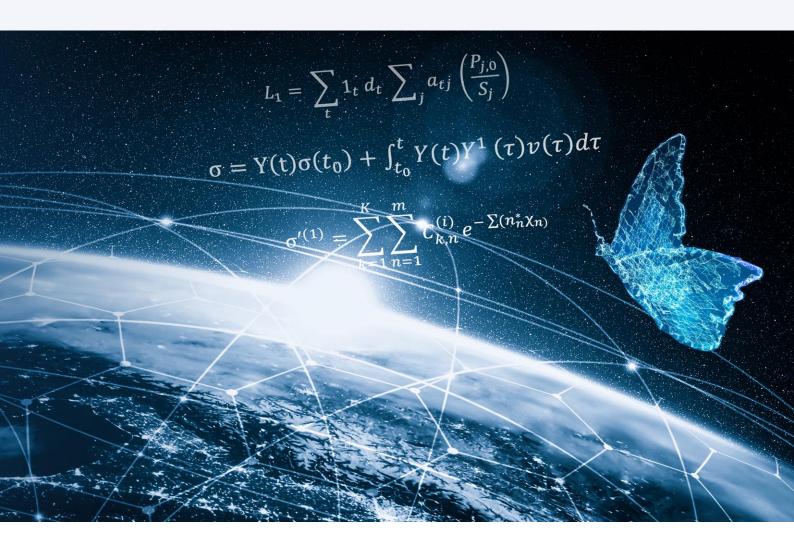- Precisely describe the problem and goals

2. Company twin implementation
- Systematically gather data
- Model the twin
- Check the integrity and functionality

3. Solution
- **Repair:** Identify weak points with sensitivity analysis
- **Optimize:** Implement improvements in the existing system
- **Transform:** Find sustainable solutions with what-if scenarios

4. Training
- Train users in working with X-ACT so that the solution can be used simply and independently

$$L_1 = \sum_t 1_t \, d_t \sum_j a_{tj} \left(\frac{P_{j,0}}{S_j} \right)$$

$$\sigma = Y(t)\sigma(t_0) + \int_{t_0}^{t} Y(t)Y^1(\tau)v(\tau)d\tau$$

$$\sigma'^{(1)} = \sum_{k=1}^{K} \sum_{n=1}^{m} c_{k,n}^{(i)} e^{-\sum(n_n^* x_n)}$$

Algorithmic intelligence – 3 operational advantages

Implementation in 3 months instead of 3 years. Thanks to the base of infrastructure data, which has grown to over 20,000 libraries in the past few decades, the digital twin does not have to be newly created, but only adjusted to the respective corporate reality. Thus, the complete twin, as experience has shown, is usually available in just 3 months.

Little input required. Unlike in large strategy consulting projects, the expenditure on the customer side for the creation of the model is minimal. The reason: Most scientific data is publicly accessible. Whatever additional data is required is usually already digital and can easily be imported.

Significantly lower IT costs. Algorithmic intelligence requires significantly lower IT costs than computationally-intensive artificial intelligence (AI). The immense costs for the lengthy development of data lakes can now be spared. Put simply: Our company twin runs on all conventional laptops.

Carbon Disclosure Project (CDP) Supply Chain Program

NTT DATA is a premium member of the "Supply Chain Program".

As a certified "CDP Gold Accredited Solutions Provider", we support our customers with the use of innovative technology in decarbonisation. The reduction of greenhouse gas emissions throughout the entire supply chain is an important milestone on the way to climate neutrality.

About NTT DATA

NTT DATA – a part of NTT Group – is a trusted global innovator of IT and business services headquartered in Tokyo. We help clients transform through consulting, industry solutions, business process services, IT modernization and managed services. NTT DATA enables clients, as well as society, to move confidently into the digital future. We are committed to our clients' long-term success and combine global reach with local client attention to serve them in over 50 countries.

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Trusted Global Innovator