

WHITE PAPER

Efficiency analysis and improvement of supply chain processes using Constraint- Analysis



The results of your supply chain processes are inadequate, you have implemented a whole series of measures, but the success was not as expected. You have probably not worked on the root causes, because these are often difficult to find.

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Contents

Putting the core causes on the chain and strengthening the organization sustainably	3
Identify root causes - define measures - solve the problem	4
The core problem - starting point and basis of the analysis	4
At the beginning is the technical-organizational process	5
No coming to terms with the past, but a constructive look into a better future	7

Efficiency analysis and improvement of supply chain processes using Constraint-Analysis

Tackle root causes and sustainably strengthen the organization

The results of your supply chain processes are inadequate, you have implemented a whole series of measures, but the success was not as expected. You have probably not worked on the root causes, because these are often difficult to find.

Supply chains represent a network of machines, materials, logistics, processes, methods, customers, suppliers, employees and business rules, whose interaction is often opaque and always complex and whose results often do not meet expectations or requirements. But how can efficiency be increased and how can key weak points be identified?

It is precisely this question that the Constraint Analysis of supply chain processes, with which Abels & Kemmner has had excellent experience for many years. Constraint-Analysis uncovers the root causes of inadequate results or perceived weaknesses, if necessary, from the supplier through your organization to the customer.

The Constraint-Analysis is an element of the American-Israeli physicist Eliyahu Goldratt (1947 – 2011) developed theory of Constraints (TOC).

The TOC is based on the realization that every organizational-technical system continues to grow until a system element reaches a limit (= bottleneck). If this bottleneck is identified and eliminated, the system continues to grow until another system element reaches a bottleneck. The bottlenecks can be of both a technical and organizational structure, but they can also often consist of internal regulations, principles or company policy. The Constraint-Analysis is a systematic method for identifying the bottlenecks mentioned.

result of the Constraint-Analysis is a so-called reality tree, which, like a circuit diagram, shows the cause-effect network between recognized symptoms and the underlying core causes ("root causes"). They represent the bottlenecks in the technical and organizational system that slow down the performance of the overall system. These core causes must be eliminated in order to eliminate the observed weak points and increase the efficiency of the overall system, as in a row of falling dominoes.

Bottlenecks are easy to identify in simple contexts:

It makes little sense to expand a motorway from three to four lanes if there is a single-lane bottleneck in front of it. Given the diverse dependencies and restrictions in supply chain management and operations the relevant bottlenecks can hardly be identified anymore.

Identify root causes - define measures - solve the problem

By dissolving the cause-effect network, many individual problems that would have been addressed in separate sub-projects and work steps in a conventional process analysis are resolved more or less automatically. This shows the effectiveness of the Constraint-Methodology.

Complex problem contexts, such as the decisive starting points for improving the logistics business model, optimising business processes and increasing profitability, can be solved with the help of Constraint-Analysis, attacked efficiently and sustainably, and subsequently eliminated.

The core problem - starting point and basis of the analysis

The starting point of the Constraint-Analysis is always a significant and subjectively perceived, or better yet, objectively measured problem, e.g.:

- The delivery readiness versus customer is too low, it is 82% when the target delivery readiness is 95%.
- The inventory turnover rates are too low with values < 1 and the inventory ranges are too high with 35% of the inventory value in items with ranges > 1 year.
- The throughput times of in-house production are 50% higher than required.
- The quality of the manufactured items has declined, scrap rates and costs are increasing, and planning is decreasing.
- The suppliers' willingness to deliver is too low; additional security mechanisms such as safety times increase costs for the company.

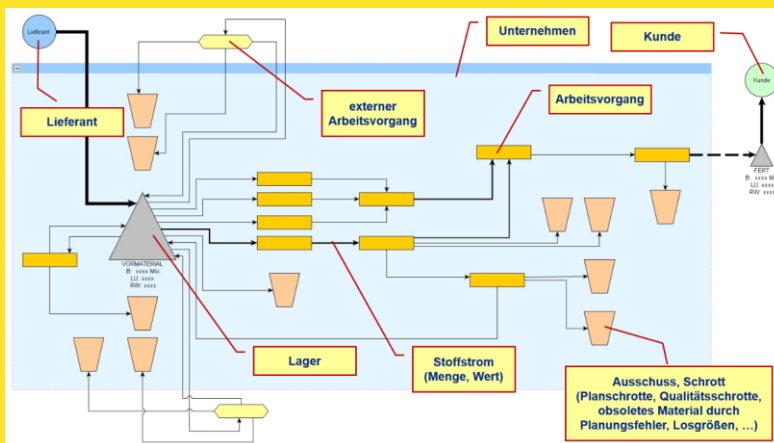
- Bottlenecks and missing parts situations in production become a permanent issue, missing parts lists and daily shop floor meetings to prioritize production orders become the leading control instrument, exacerbate the unrest in production and thus the problem itself.
- And much more.

At the beginning is the technical-organizational process

One Constraint-Analysis of supply chain processes begins with recording the company's value stream or the processes of all relevant company areas. This step creates transparency and is often an essential tool not only for external but also for internal project employees to understand the overall context.

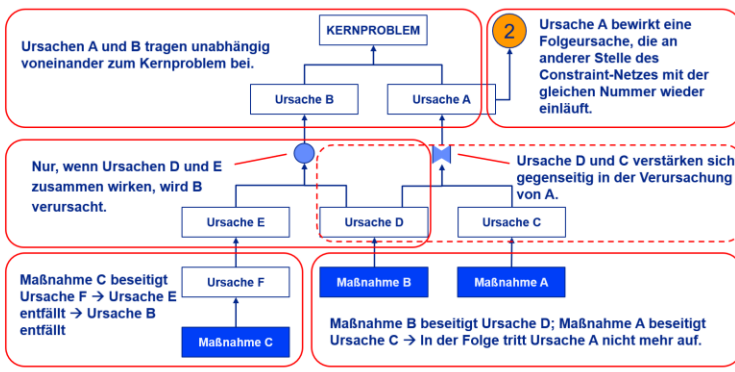
Sub-fragments of the cause-effect network are then identified in workshops and interviews with the departments involved. The interviews make it possible to examine certain causes and their effects from different departmental perspectives. If necessary, relationships can be proven, refuted or their effectiveness examined through analyses and simulations.

The cause-effect network is developed from the analysis results until the core causes are identified.



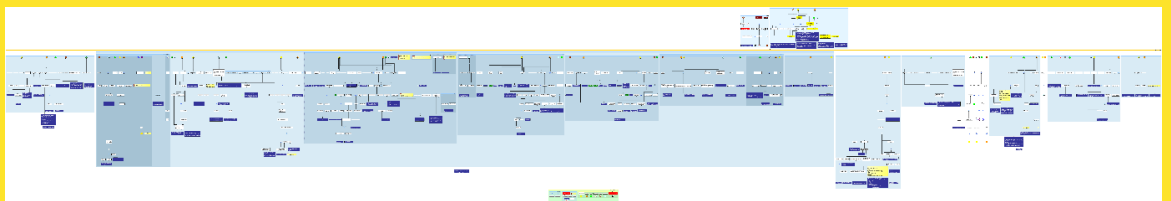
Die Ursache-Wirkungskette:

- „Wodurch wird das Kernproblem verursacht?“
- „Und welche Maßnahmen sind geeignet, die Kernursachen zu attackieren?“



Once the core causes have been identified, it is important to define levers that are suitable for eliminating the core causes. These levers can consist of simple measures, but can also represent independent projects and must be grouped into fields of action and prioritized. Prioritization is important because not all actions can be addressed at the same time, are partly dependent on one another and require different implementation times.

The picture is the result of a real Constraint-Analysis on the question, "Why is our delivery readiness not as desired?" at a glance. The graphic gives an impression of the possible complexity of such an analysis and its results.



In the concrete example, 72 measures were defined within the framework of 13 identified fields of action that attack the causes of the core problem and thus solve the core problem.

In the transmission production of a large automotive supplier, we succeeded in Constraintanalysis to increase production throughput by 10% without having to invest in capacity expansion.

No coming to terms with the past, but a constructive look into a better future

The ConstraintAnalysis cannot replace the experienced supply chain expert, but it helps him to systematically and effectively uncover the crucial bottlenecks and find remedies. The effectiveness of the defined measures is shown in detail in the reality tree, the question of guilt and responsibility is never raised, nothing needs to be hidden or swept under the carpet.

The elephant-sized challenge is broken down into digestible slices. No one is wasting time fighting the wrong causes of fire anymore.