valantic

Connected Plant

Control, optimization and automation of processes and digitalization of material flows

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Connected Plant

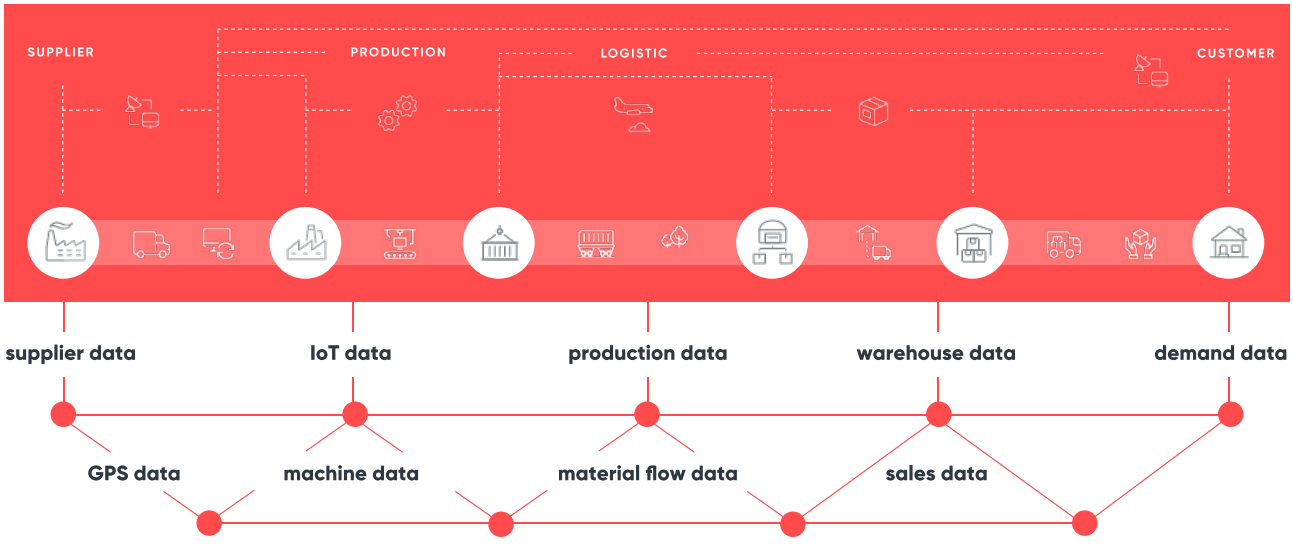
The Big Data age has a significant impact on logistics. New innovations and trends such as the Internet of Things (IoT) are generating ever greater volumes of data along the supply chain. However, the mere collection of data does not offer any added value without proper analyses and the derivation of relevant insights.

The challenge is instead to intelligently link and enrich the collected data in order to gain valuable insights. Based on a sound database, predictive analyses can help to proactively counteract risks and exploit optimization potential. Intelligent algorithms, such as machine learning, help to monitor, control, optimize or automate processes and thus realize the digitalization of material flows and come one step closer to the realization of Industry 4.0.

With profound logistics know-how and a deep understanding of processes, valantic supports companies in identifying the right starting points of a networked plant and in asking the right questions for data-driven insight generation and implementation of Smart Logistics.

In doing so, we focus on the networking of an individual plant, but also in a plant network. By combining our competencies in the areas of supply chain management and data science, valantic can drive data integration, transformation and analysis in companies in the long term.

To generate sustainable and consistent added value from data, data use cases must be successfully scaled and industrialized. With the combination of our expertise in the areas of Supply Chain Management and Data Science/KI, we create the ideal conditions for successful projects with our customers.



5 Challenges for the use of data science in logistics

1

Data Availability

In order to analyze data and gain insights from it, it must also be available in the appropriate quantity. Data can be collected with suitable sensors or obtained from internal and external sources. Especially for learning models, it is important to have enough data sets to train the model. In addition, the data must be stored in a structured manner and access to the necessary data must be possible, which is ensured, for example, through the use of a data warehouse.

2

Data Quality

In addition to the quantity, the quality of the data also plays a major role, of course. The quality of the results of an analysis depends significantly on the quality of the input data. The data should be complete, accurate and up-to-date, available in a consistent form and, of course, contain a certain information value. To ensure conformity with systems and methodologies, data must be prepared so that it is available in a suitable structure.

3

Identification of suitable use cases

Logistics is based on many complex processes. Therefore, it is a challenge to find the right starting point for an application of Date Science methods. The formulation of use cases requires a deep understanding of the processes and the company situation. Therefore, it is important to collect and elaborate possible use cases together with the business departments and to evaluate their relevance and feasibility. The interaction of process, business, and data expertise is crucial.

4

Choice of the right model

The right model and analysis procedure must be selected for each question and initial situation. In addition, the appropriate parameters must be selected for a large number of models. The requirements (e.g. speed, precision) as well as the given conditions (e.g. data quantity) of the situation must be taken into account.

5

Making complexity controllable

A data science project in logistics can reach a high degree of complexity due to the multi-layered processes as well as the sophisticated analysis methods. In order to master this complexity, an agile way of working is indispensable. An iterative approach as well as multiple evaluation, testing and extension of models makes the project a success.

5 Opportunities for the use of data science in logistics

1

Proactive instead of reactive action

By linking data and applying Date Science methods, risks can be identified at an early stage, behavioral patterns can be recognized and valuable forecasts can be made. As a result, result- and goal-oriented measures can be initiated at an early stage instead of reacting only after situations have already occurred.

2

Fact-based decisions

The results of data analyses can serve as a sound basis for decision-making. The application of machine learning and artificial intelligence makes it possible to solve very complex problems. This means that important decisions can no longer be made on the basis of „gut feeling" alone, but can be supported by facts and correct starting points and measures can be identified.

3

Efficiency increase andautomation

The data basis and analysis results created can be used for automation solutions, saving time and costs and thus achieving sustainable increases in efficiency.

4

Increase of transparency

Dimensional reductions, intelligent clustering and pattern recognition can reduce complexity and present facts in a more comprehensible way. The digital representation of processes as well as the preparation and clear visualization of data increases transparency and can increase the acceptance of decisions in the company.

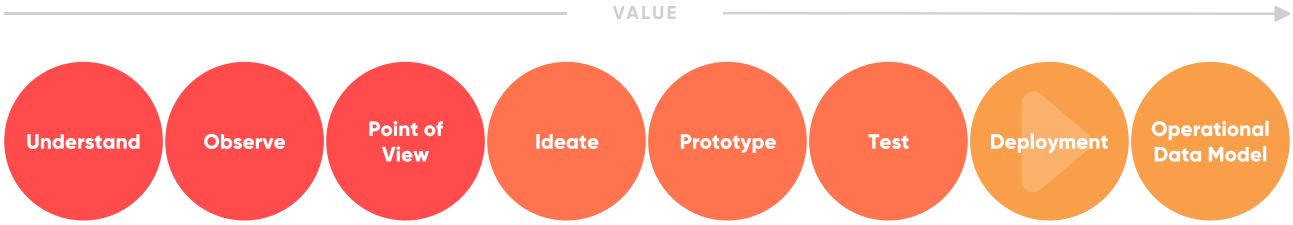
5

Successful transition into the digital age

The availability of data and the possibilities of artificial intelligence are increasing more and more rapidly. In order not to lose touch with the developments of the digital age, you should get into the promising topic now and make your company fit for the future.

Procedure in Connected Plant Projects

valantic's project procedure is always agile and innovative when it comes to implementation. In the Innovation Lab, we work with our customer to focus on the particular use case. Here, we try to describe and define the problem precisely. Data availability and basic conditions are clarified so that the solution space is defined. Our goal is to develop a prototype in the Data Lab as quickly as possible, to test it and make it functional. As part of data operations, the functional prototype then becomes an operative data product.



INNOVATION LAB

Use Case development

- Create a common understanding of the problem
- Identify and understand customer needs
- Delimitation of the solution space
- Definition of specific goals
- Data acquisition
- Integration of data sources (DWH)

DATA LAB

Data Science Project

- Review and analysis of the data
- Development of statistical models and machine learning models
- Data visualization
- Interpretation of the results
- Testing of the prototype and evaluation of the results

DATA OPERATIONS

Data Product

- Data policies and security
- Technical implementation (automation, architecture)
- Organizational embedding

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