Machine Learning Optimizes Evaluation of Raw Business Process Data

Deep Qualicision AI Analyzes Data Streams

As an integral part of the PSI framework for industrial intelligence, Deep Qualicision AI's qualitative labeling prepares raw business process data for process owners in an understandable form. This takes place by qualitatively evaluating directly measurable data in business processes using KPIs and learning relations to this data. In this way, new insights are automatically obtained from the raw business process data, which can then be used to improve organizational measures in the business processes. This software-based method shows how data stream analysis by way of artificial intelligence can enhance added value.

Deep Qualicision is a machine learning software tool that is based on independent recognition of KPI-based relations in business processes. Raw business process data is evaluated using Extended Fuzzy Logic and special cluster processes. This makes the introduction into the world of AI methods conceivably easy for companies—even for SMEs. The KPI relation analysis automatically allows business process data to be classified in such a manner that relations can be derived from raw data, which enables further meaningful use of data for humans by means of AI methods.

Easy Input Consisting of Time Series Using Business Process Data and KPIs

Software input consists primarily of two main components: first, data streams from the business process to be analyzed are recorded and automatically converted into time series (in short, TS) using timestamps. Second, indicators (KPIs) that are to be used for analyzing the relevant business process are determined with the owner of the business process (in short, POWN). In addition, the value ranges of the KPIs are divided into required and non-required value ranges. If, for example, the utilization and the setup times for an unit in a manufacturing company are seen as KPIs, a percentage value greater than 85 % can be specified as desirable and positive. Values below 85 % by contrast are negative, and are considered to be progressively more unfavorable the more they deviate downwards from this minimum value. Similarly, a setup time portion of less than 10 % can be considered positive; over 10 % is not desirable and is considered as negative (see Figure 1). This evaluation of positive and undesirable ranges can also be performed by a POWN without in-depth AI knowledge because this is in line with the process owner's daily evaluation of process workflows.

Learned Knowledge in the Value Chain Made Understandable for Humans

When these and similar data streams and associated KPIs are provided with timestamps and continuously stored along the business process value chain, they result in time series which are

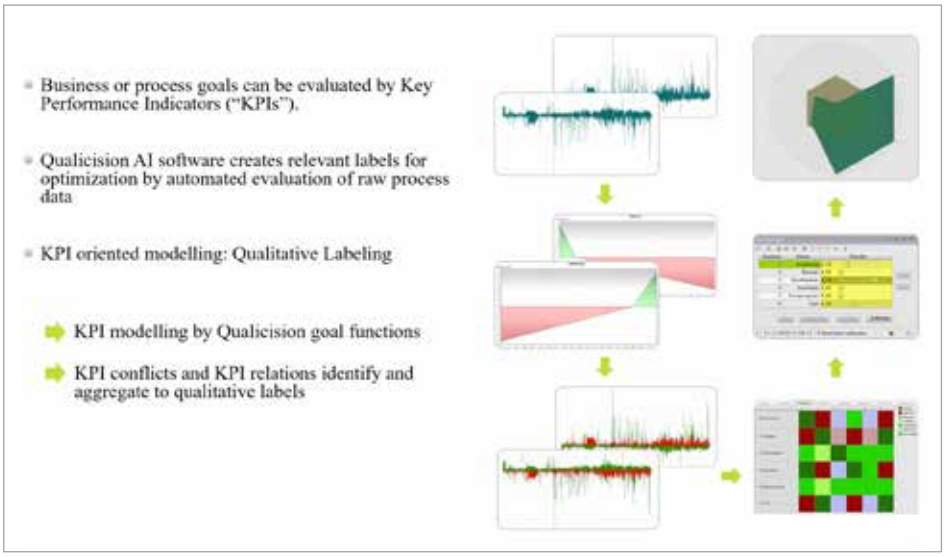

Figure 1: Qualitative evaluation of process KPIs.

evaluated directly by Deep Qualicision in such a way that positive and negative relations are recognized and learned in sense of KPIs. These can be made available to the process owner (POWN) in an easily understandable form.

Examples of positive relations could be properties of orders that match the capabilities of the manufacturing process particularly well. Negative relations could for example be the reasons for delays in relation to planned dates, or classes of order properties that increasingly lead to bottlenecks in the business process.

Automated Recognition of Improvement Potential

Findings of this nature can be directly considered and used by the POWN to initiate organizational measures. For example, if for certain variant combinations of product properties deadlines are missed frequently, or if the unit utilization is reduced, a different approach can be taken specifically for products with these properties.

Based on the KPIs, it is also possible to accurately evaluate what improvement potential the measures to be introduced would offer from a monetary perspective. With a high degree of certainty the initiation of these measures will be successful, as the measures are derived directly from the business process data using Deep Qualicision AI.

Preparing for the Usage of Advanced Optimizing AI Methods

Automated derivation of qualitative knowledge by learning about relations from raw business process data combined with KPI information of the business process is also useful not

Figure 2: The Deep Qualicision framework with qualitative relations learned from time series of business process data.

only for gaining knowledge about the relevant business process. In fact, the proceeding prepares companies for the subsequent use of additional AI methods for optimizing their business processes. Each newly acquired relation is potentially the basis for an additional indicator that can be included in the Deep Qualicision analysis as feedback in the form of a KPI.

In this way, companies can not only control their business processes in a targeted manner, but can also progressively transfer them into de facto self-optimizing closed loops.

Using business process data therefore makes it a great deal easier to meet the challenges of the increased dynamics of business processes. These dreaded dynamics lose their fear factor. The interface of the associated software is shown in Figure 2.

Deep Qualicision AI as an Integral Part of the PSI Framework for Industrial Intelligence

The learning analysis process described above can be repeatedly initiated on a rolling basis. The universally applicable nature of the software means that any existing PSI software that operates on the basis of processing KPIs can be used as a KPI analysis machine. Any existing PSI application can be extended with self-learning analysis capabilities that systematically lay the groundwork for the introduction of additional AI functionalities. To make this extension permanently available in the future, the software is linked to the PSI framework for industrial intelligence (CII framework) by means of the PJF-based PSIbus technology, for example. The methodology shown can be introduced across all layers of the business processes (see Figure 3). As a result, an AI-based architecture of analysis and usage logic gradually evolves. This logic enables the detection of process relations, beginning with raw business process data, through qualification of data using KPIs to machine learning.

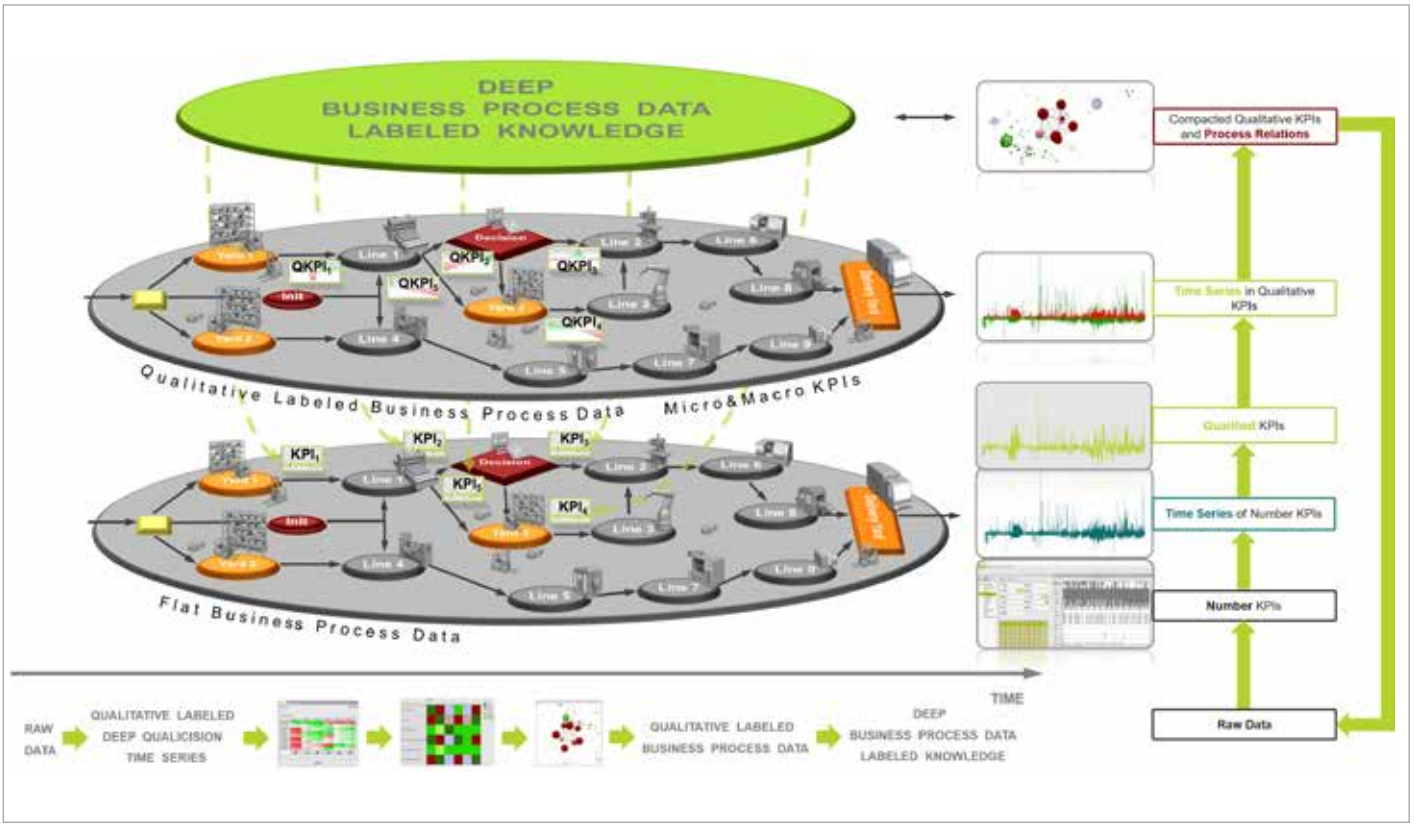

Figure 3: Level model of business process data analysis.

Summary

Differential concentration of business process data results in a new quality of data evaluation for added value in your own companies. Business process data becomes information and the actual raw material of the future.

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