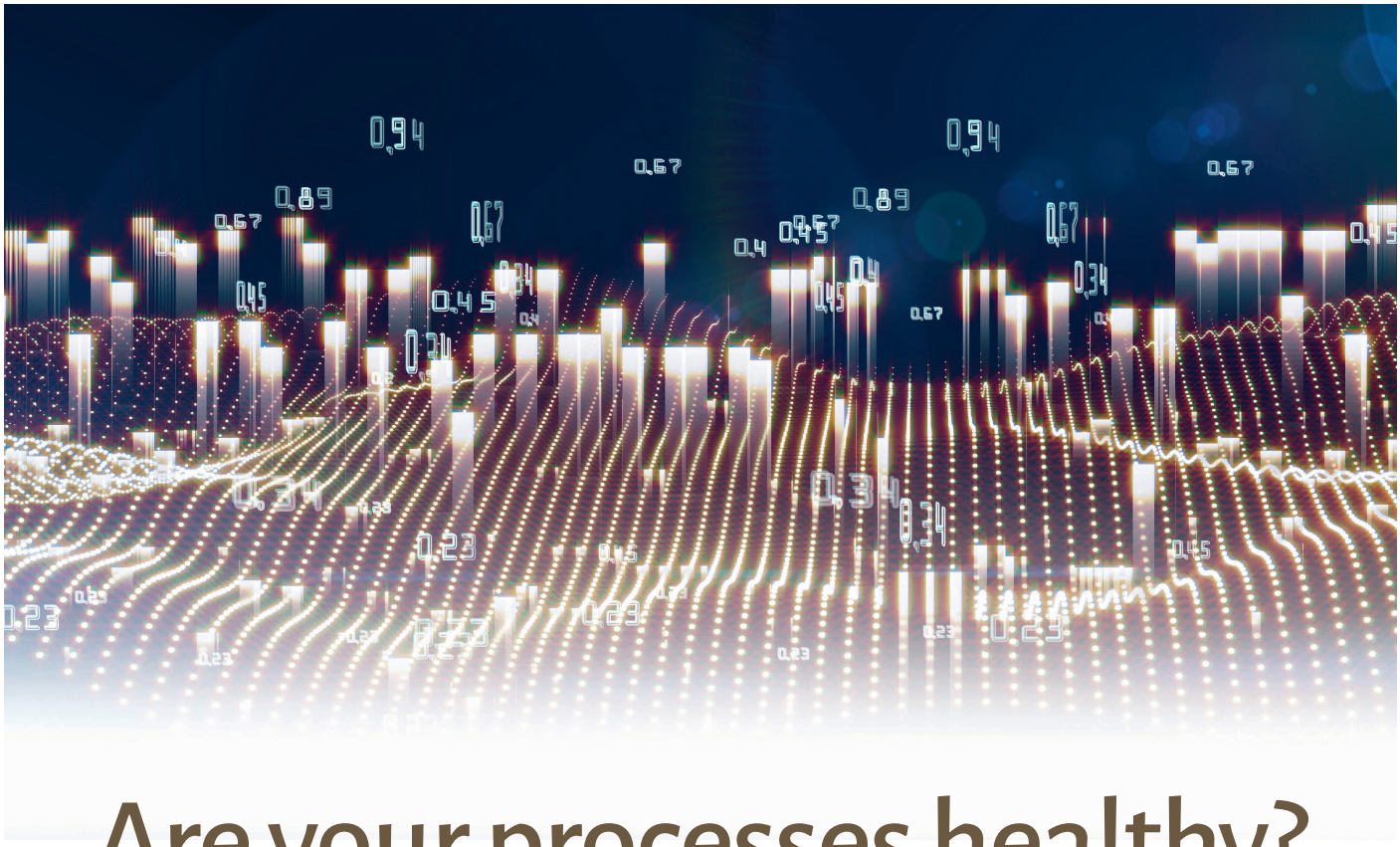


Are your processes healthy?

Putting processes through their paces with Process Mining

Automation without an understanding of what is to be standardized, whether using machines or IT, can quickly lead to quality deficits. Process mining helps in process optimization as well as identification of new opportunities for automation, but this must be complemented by a systematic evaluation and implementation methodology so that the new insights lead to effective action.

Christoph Goldenstern

We are on the threshold of „hyperautomation". This term was coined in 2019 by the research and IT consulting firm Gartner and has since been used as an umbrella term for the current trend: Business and IT processes should be automated as much as possible with the help of new technologies. The goal is usually standardization and cost reduction, but also to increase process stability in the long term by reducing manual tasks and making human resources available for more demanding activities.

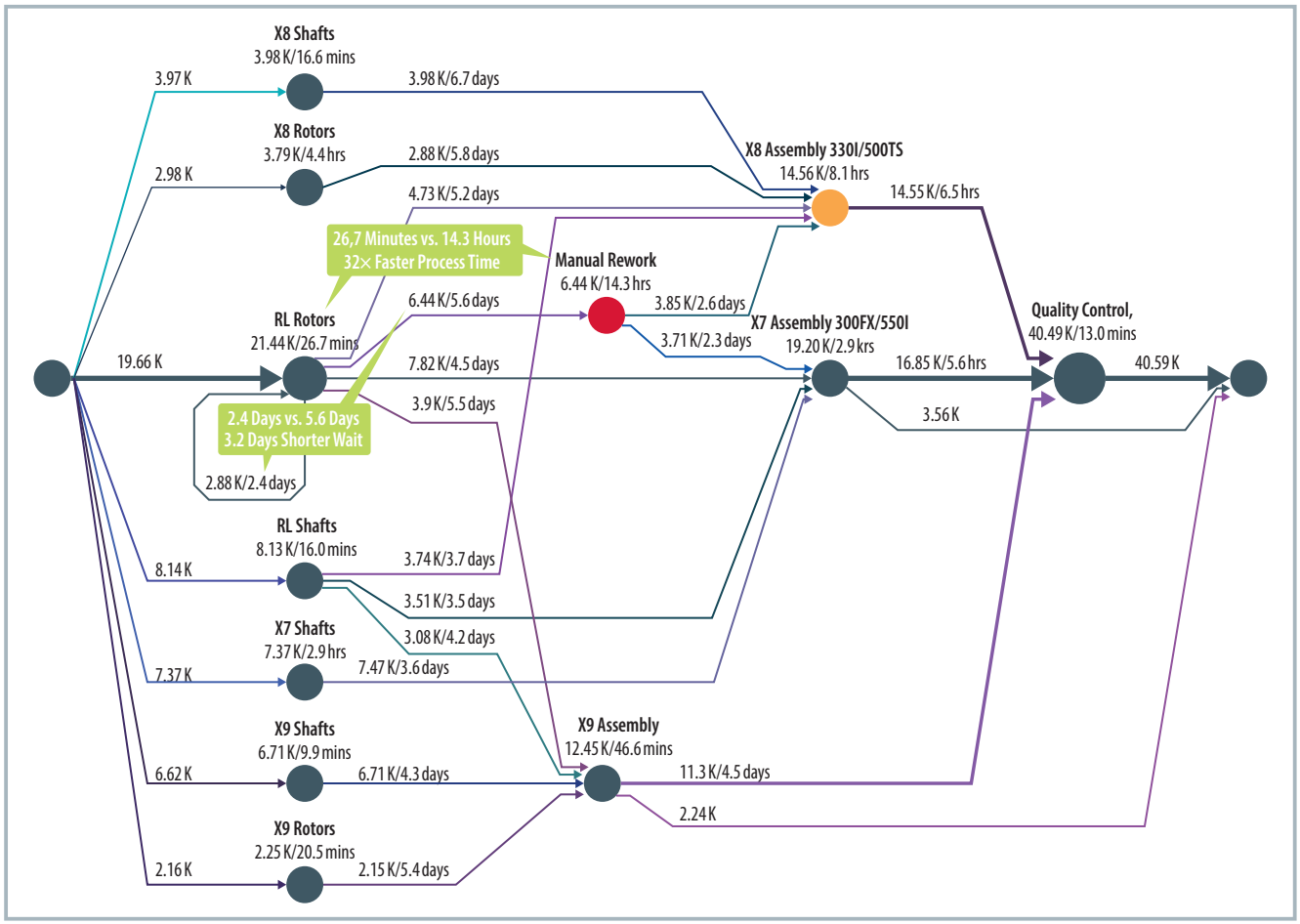
Tools and technologies used in hyperautomation include Artificial Intelligence (AI), Machine Learning (ML), Robotic Process Automation (RPA), and app developments via low-code/no-code platforms.

Even though the potential of these new technologies to increase the efficiency of many companies is undisputed – "blind automation" would be just as counterproductive as sticking to outdated technologies and manual processes. Also, experience shows that many of these workflows are no longer up to today's business dynamics and ever-increasing flood of data.

One thing hasn't changed: Processes are still the foundation of every company's value creation. Against this background, it is important to first understand the critical processes in our companies in detail and to establish a baseline. Here, traditional process mapping and analysis tools are facing an increasing problem: too much data and a lack of insight into reality.

Processes are the basis of value creation

Traditional process mapping in particular has limitations in this regard. On the one hand, it is becoming increasingly difficult to grasp the complexities of networked business processes; on the other hand, the sheer amount of data and possible process »»



Process modeling is followed by data analysis Source: Kepner Tregoe © Hanser

deviations – and variations in the process behind them—often cannot be mapped and effectively analyzed with common visualization tools.

In addition, the whole undertaking is often highly subjective, because ultimately internal „process experts" are often more familiar with the Should than the Actual. But how do we know that the process descriptions of our employees correspond to reality? Even if we randomly check process data for consistency, how trustworthy is this analysis when we have several thousand process runs per year?

For this reason, we see the need to complement qualitative with quantitative methods that make it possible to substantiate the symptoms with hard facts.

Accurately examine reality with Process Mining

The challenge of analyzing the ever-increasing amounts of data in order to derive improvements from them is not a new one. The term of "data mining" gained popularity in the 90s and then quickly gained momentum, as increasingly powerful databases and processors were developed. In today's context, we usually only talk about Big data.

Process mining (data mining applied to processes), on the other hand, is still a relatively new discipline that originally emerged from research at the University of Eindhoven. The commercialization of this new technology began around 2007 and has developed rapidly in recent years.

By employing Process Mining, it is now possible to take what could be described as a "digital X-ray" of a process based on the data recorded in IT systems to analyze the process for its consistency with the target process and to uncover opportunities for both optimization and automation.

In order to apply Process Mining effectively, three fundamental data points are needed:

- A record-specific „unique identifier" such as a batch, SKU, order number, or incident ticket number (depending on the type of process)
- Defined process steps recorded in the respective IT system (ERP, CRM, etc.) – also called „events"
- Timestamps associated with the process steps that record the start and/or end of a process step

If these data points are available, we must first develop a data model to help us understand the various databases that each piece of data is coming from and in what way these need to be combined. The step of data identification, extraction and transformation is an essential preparatory step in ultimately obtaining meaningful results.

During Process Mining, a so-called event or activity log is developed from this data, which can then be modeled (visualized) by the Process Mining platform and analyzed by employees.

Analysis and optimization drive Process Mining

Once the process has been modeled, the real work begins: analyzing the data. Based on the existing data, Process Mining can be used to summarize and visualize key met-

Problem Statement: RL Rotor Manual Rework has excessive WIP		
	IS	IS NOT
WHAT	RL Rotors	X8/X9 Rotors
	EXCessive WIP/Queuing	Complete scrap
WHERE	Manual Rework (MR) station	RL Rotor MFCT Station (when self-corrected)
	Rotors	Shafts
WHEN	June 15	Before
	Continuous	Sporadic
	Before manual rework	Before RL Rotor Station (when self-corrected)
EXTENT	Average queuing MR: 5.6 days	Average queuing: 2.4 days
	6.44k parts	All parts/21.44k

Problems are specified precisely

Source: Kepner Tregoe

rics very quickly and efficiently, such as:

- Throughput and waiting times („queuing")
- Deviations from the target process and variability
- Rework
- Process bottlenecks
- Waste or
- Process costs

In the subsequent analysis, the core objectives and KPIs (key performance indicators) of the process that is being evaluated are particularly important to allow us to focus on the most important areas. For this purpose, we have a few different analysis perspectives to choose from:

- If, for example, it is specifically about the *compliance* of the process (the correct adherence to the steps and sequence), all deviations from the target process must be critically examined.
- If the main focus is on *evaluating process efficiency* and/or quality, the focus should be on lead times, process bottlenecks and waste.
- If the main goal is greater *automation* of manual and administrative activities and sub-processes, the focus should be on high waiting times within the process, among other things.

In this analysis, the data can be filtered very specifically and in depth via the Process Mining platform, strategically divided and broken down into smaller data sets to support root cause analysis.

In order to make this process as effective as possible, a systematic problem solving process should be used that clearly describes and prioritizes the critical data points and observations and then systematically evaluates them for their causes in the form of a problem analysis based on the facts gathered from Process Mining.

Kepner-Tregoe's best-practice analysis method is particularly helpful here, as it supports a consistent, scalable and structured processing of the facts and evaluation of the hypotheses. This root cause analysis can then be used to develop targeted solutions to simplify the process, make it more efficient, resolve resource bottlenecks or, if necessary, restructure it.

The strategic goal should be to increase quality, efficiency and stability, especially if the next step is to achieve a higher degree of automation.

Process Mining based on a quality process

As already mentioned, Process Mining can be applied to a wide range of processes: from manufacturing, to IT, logistics, finance and supply chain processes as well as administrative or quality processes.

In the specific case of a supplier to the aviation industry, the primary goal was to identify the causes of the long throughput times in the quality process as well as the overall low success rate, as the many open investigations represented both a significant cost and risk factor for the company.

Process Mining was used to identify and

INFORMATION & SERVICE

SOURCES

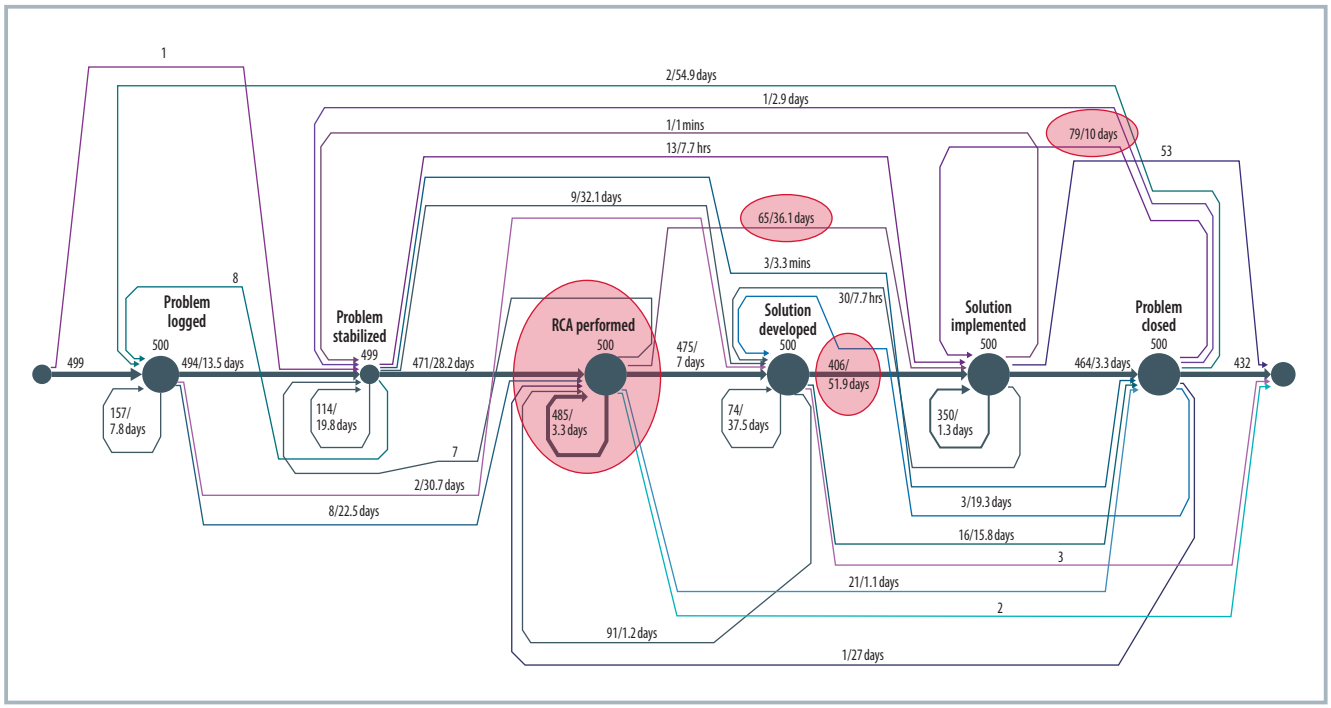
- www.gartner.com/en/information-technology/glossary/hyperautomation
- medium.com/@exastax/the-history-of-data-mining-d2aeb0f587ce
- www.appian.com

AUTHOR

In his role as Vice President of KT Digital at Kepner-Tregoe, **Christoph Goldenstern** supports the development of innovative, digital solutions as well as clients who want to sustainably optimize their processes.

CONTACT

cgoldenstern@kepner-tregoe.com



The problem solving process is clearly illustrated. Source: Kepner-Tregoe © Hanser

quantify a wide variety of problem areas, which were then systematically evaluated in a further step:

- **Significant rework,** especially in the RCA analysis (Root Cause Analysis) due to a lack of a systematic approach (over 50% of cases)
- **Delays in the process,** especially in the implementation of the solution due to many administrative review requirements in the quality management software and documentation (average total duration of 52 days)
- A regular **bypassing of essential process steps in the QM system** (especially in the solution development phase), which often resulted in a later reset in the process (in 15.6% of cases)
- Overall, very high **variability in the process** with over 25 process variants (significantly more than expected) due to overall passive process management

In the next step, the precise description and quantification of the problem areas enabled prioritization and subsequent detailed analysis and elimination of the causes using the Kepner-Tregoe methodology described above.

Striving for continuous quality improvement

After an initial baseline process analysis, Process Mining can also play an essential role in continuous improvement.

For this purpose, the corresponding Process Mining platform must remain linked to the respective data sources (e.g. via an API – Application Programming Interface) in order to remodel the process at regular intervals and to track whether the process changes made also achieve the desired results.

After the process has been optimized and stabilized, further opportunities for automation can be derived from this over time, especially in process areas that are characterized by a high degree of standardization and repetition and involve many manual activities.

Translated by Kepner-Tregoe

Masthead Publisher:

Carl Hanser Verlag GmbH & Co. KG, Kolbergerstr. 22, 81679 Munich;