AI QUALITY IMPROVEMENT ALONG THE ENTIRE PRODUCTION PROCESS

Application for the manufacturing industry - Self-learning AI improves production quality in complex variant production

SUMMARY

Despite all the intermediate inspections, products still fail the final inspection at the end of the production line (functional end-of-line inspections). Even a very small percentage is too much when more than 10,000 products a day are being produced. Self-learning AI can discover the complex root cause relationships in a multi-variant production process, enabling the causes of substandard quality to be eliminated. This is essential in a 24/7 production environment.

CURRENT SITUATION

Producing more than 10,000 components a day, in 700 variants, calls for highly automated series production. Each product, consisting of as many as 600 parts, undergoes a technical 100% test before being delivered. Even though critical steps are inspected repeatedly during the production process and only components that are within specification go on to the next stage, rejects are identified at final inspection.

PROJECT DESCRIPTION

With this digitalization project, the international automotive supplier is seeking to provide all necessary information to the relevant decision makers quickly so that the plant is able to achieve optimum results with high-quality products.

REFERENCES

www.ispredict.com

SOLUTION

Predictive Intelligence, the self-learning artificial intelligence (AI) solution from IS Predict, discovers cause/effect relationships quickly and reliably. Speed is very important, given that production runs 24 hours a day, 7 days a week. The faster the actual reasons for defective products are identified, the faster corrective action can be taken to avoid malfunctions in future. This saves time and significantly reduces scrap. The aim is to reduce scrap by 20% in some production areas. The main success factor is the rapid detection mechanism within the production chain which is implemented using AI.

As a result, the time taken to establish cause and effect can be reduced from several days to just hours.

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INDUSTRY 4.0 FEATURES

The data on all end-to-end production processes is held in a data lake. Self-learning AI algorithms use traceability to directly discover the root causes that lead to poor quality or scrap. Continuous learning ensures that the AI solution remains consistently reliable even when there are production changes.

STANDARDIZATION APPROACHES

Thanks to the self-learning algorithms obtained through AI analysis, the highly-scalable solution can also be used for other complex production processes with high variant diversity. The necessary model interfaces are not specified in international standards. Nor does the data have a standardized semantic description (administration shell), and this results in integration costs.