

Warsaw, November 29th 2021

**A reference letter for**

**ITnine**

**for the implementation of a project related to the use of  
predictive maintenance in production processes**

**The use of predictive maintenance in production processes**

Predictive maintenance, as one of the elements of Industry 4.0, assumes the implementation of a strategy that allows the best use of devices and processes in the enterprise. The main goal of such strategy is the optimal use of resources, leading to lower production costs and maintaining high quality of products. Such actions are based, inter alia, on conducting systematic diagnostic tests, on the basis of which it is possible to make business decisions.

Production processes generate not only business value, but also the risk of losses and ineffectiveness. As a result, there may occur: production downtime, costly losses or additional indirect costs (service work, additional inspections). For this reason, Stellantis decided to implement a predictive maintenance solution and the IT9 team was selected to implement the project.

**SUBJECT OF THE PROJECT: APPLICATION OF MACHINE LEARNING FOR MAINTENANCE**



The aim of the work carried out by the supplier was to **build and implement a system based on the Siemens MindSphere cloud and machine learning solutions**, ultimately allowing for:

- monitoring of technical parameters of devices,
- monitoring based on current data from devices delivered to the Siemens MindSphere cloud via dedicated Siemens MindConnect Nano controllers,
- use of the mechanism of alerting employees of the Maintenance Department via e-mail,
- use of analytical and predictive functionality – predicting faults, losses and leaks – warning against abnormal operation of the observed station,
- access to data via MindSphere.

As a result of project implementation, the developed analytical application, based on the real-time transmission parameters of the robot assembling car windows, warns against failures related to the delivery and application of glue (e.g. events such as: “Clogged cable”, “Risk of cable rupture”).

#### Process characteristics:

1. The robots on the production line have sensors that collect data on the technological process.
2. The collected data is transferred via MindConnect Nano to the MindSphere cloud.
3. Siemens MindSphere collects the transmitted signals and makes them available to the analytical application developed by IT9, shared in the Siemens MindSphere cloud.
4. Developed application:
  - a. receives and validates raw data from MindSphere,
  - b. processes raw data,
  - c. based on the forecast result and historical data, the system state is analyzed and predicted,
  - d. enables visualization of collected data for at least last 4 hours,
  - e. stores and makes available the collected historical events,
  - f. sends e-mail notifications regarding failure to production line operators.

#### Implementation

The project was completed by IT9 on time and in accordance with the adopted assumptions and goals.

**We would like to emphasize that:**

- the project was carried out efficiently and with minimal impact on users' work, while taking into account business needs,
- the application interface has been adapted to our needs, in accordance with the submitted comments,
- communication with IT9 was smooth.

Considering the above, we are satisfied with the cooperation with IT9 and with the results of the project. **We recommend IT9 as a service provider in the field of modern technologies, digital transformation and Industry 4.0.**



Marcin Rozładowski

**FCA POLAND S.A.**  
ul. Grażyńskiego 141, 43-300 Bielsko-Biała  
**ZAKŁAD TYCHY**  
ul. Turyńska 100, 43-100 Tychy  
tel. +48 32 217 91 00  
REGON 070037916, NIP 547-004-86-27  
KRS: 0000019628-Sąd Rejonowy w Bielsku-Bi  
kapitał zakładowy 660.334.600 PLN  
kapitał wpłacony 660.334.600 PLN