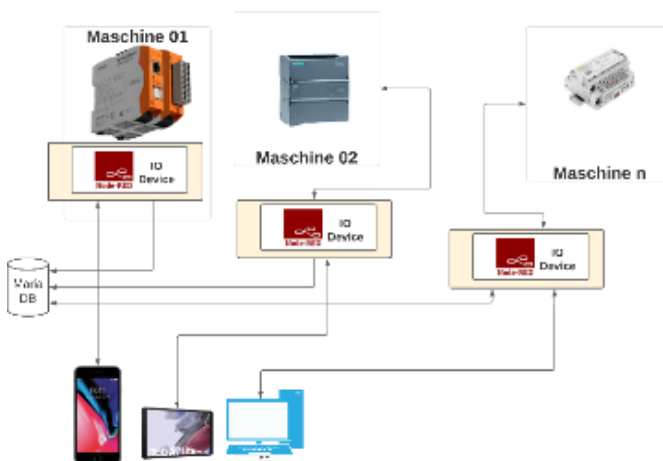




1. the challenge

Our customers have often confronted us with the following challenge: they need a simple and fast way to detect the Overall Equipment Effectiveness (OEE) factor of their production in order to produce more efficiently. Additionally, the software should include integrated order processing for the produced parts. Initially, we thought that there would surely be ready-made software on the market that would meet these requirements. Indeed, there are some great systems like Forcam (a subsidiary of SAP), Bosch, or Siemens, which are well-suited for large-scale production processes (e.g., automotive industry). From 2021 until today, we have also supported one of our customers in implementing such a system as a production control system. However, we discovered that these large systems are expensive and require significant effort to integrate into existing processes. Therefore, the implementation of such systems is not feasible for many smaller companies. This realization led us to decide to develop our own Shop-Floor-Management system. With our system "OEE Sniffer Dog," our customers can easily, cost-effectively, and in real-time monitor the OEE factor of their production to quickly identify and improve weaknesses in their production processes. As a result, they can optimize their overall productivity. The order management has also been integrated to seamlessly represent the entire production process.



Our approach involves directly capturing the necessary signals for calculating the OEE factor using an IoT interface at the production plant. The interface retrieves relevant information such as "Automatic production started," "Production pause," "Setup," "Production disruption," and "Finished parts per machine," which are needed for OEE calculation, directly from the production plant. Additional signals can also be collected. The collected data is then processed with a platform-independent software called Node-Red and stored in a local Maria DB. Our device

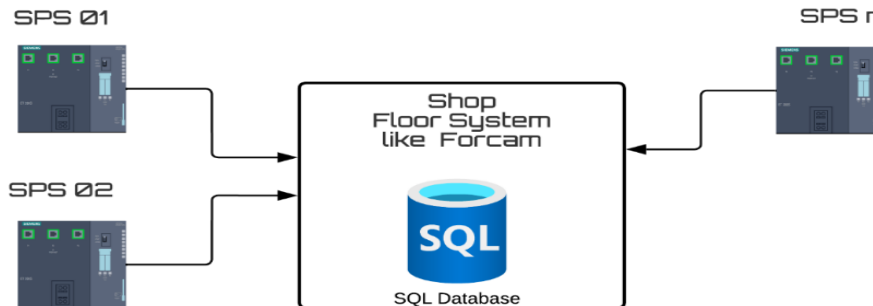
is cost-effective and can be connected to any production machine within a short time using the Ethernet interface (MQTT, Siemens protocol) or a simple terminal block. This enables flexible integration into existing production plants. The user interface of our app can be operated and monitored with any end device (PC, tablet, or smartphone) connected to the network via TCP-IP. This provides users with real-time access to data from anywhere, allowing them to efficiently monitor and optimize production.

With this solution, we offer our customers a cost-effective way to monitor the OEE factor of their production, quickly identify bottlenecks or weaknesses, and make targeted improvements.



2. difference between our solution approach and the known systems

[unique selling propositions]



The difference between our solution approach "OEE Sniffer Dog" and the well-known systems like Forcam, Bosch, or Siemens lies in several aspects:

Target audience and scalability: Our solution approach aims to cater to the needs of smaller companies that may not have the financial resources to implement the expensive and complex systems of Forcam, Bosch, or Siemens. These large systems are typically designed for large-scale production processes, such as those prevalent in the automotive industry, and can be used in complex environments with many machines and facilities. On the other hand, our system is intended to offer a cost-effective and flexible solution for smaller companies looking to make their production more efficient.

Cost and integration effort: The established systems of Forcam, Bosch, or Siemens often require significant investments in both software licenses and integration into existing production processes. In contrast, our approach utilizes a proprietary Shop-Floor-Management system specifically designed for easy and quick integration into existing production facilities. This can significantly reduce implementation costs and integration efforts, enabling smaller companies to benefit from our system.

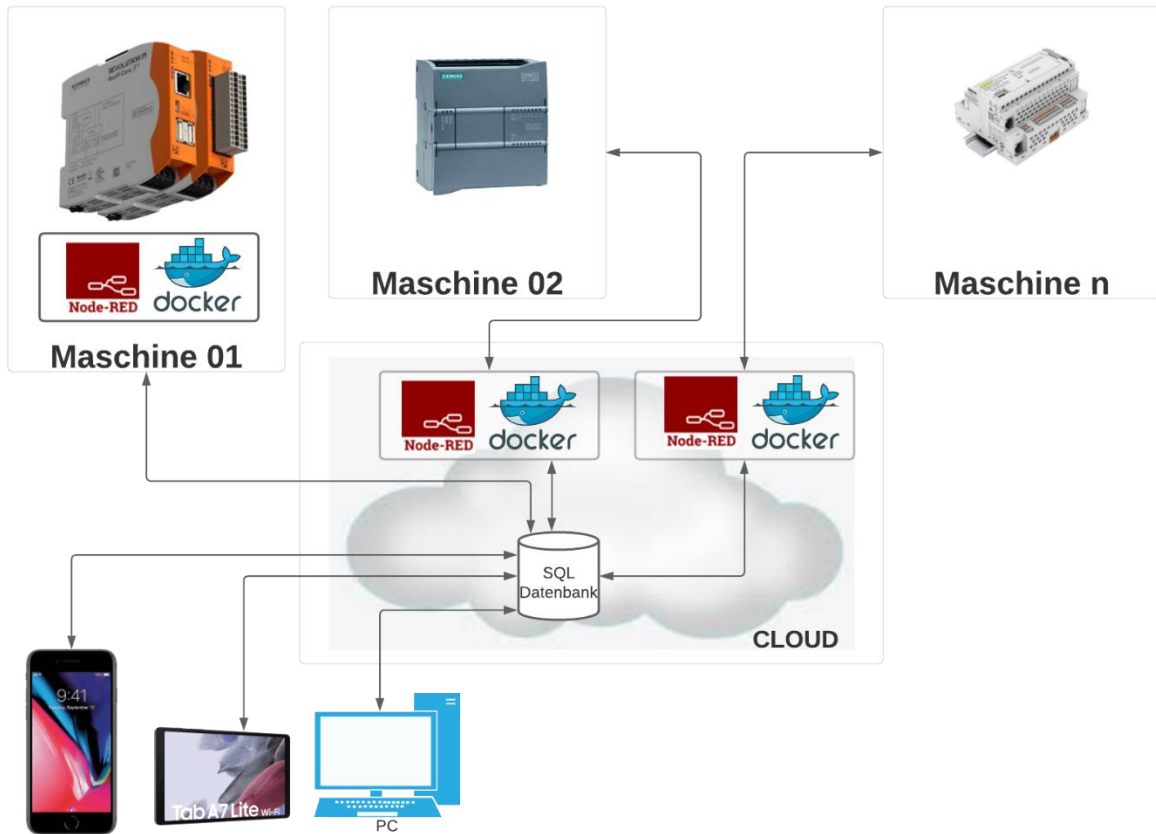
Data acquisition and processing: While the large systems like Forcam, Bosch, or Siemens may be capable of capturing extensive data directly from production machines and facilities, our solution approach uses an IoT interface to capture the necessary signals for calculating the OEE factor. This allows for a cost-effective method of collecting relevant production information and processing it in real-time.

User-friendliness: Our "OEE Sniffer Dog" system follows the approach of providing a user-friendly interface that can be operated and monitored from any end device (PC, tablet, or smartphone) with TCP-IP connectivity. This enables users to easily access real-time data from anywhere. While the large systems may also have a user interface, they might offer more complex features and controls suited for complex environments, which may not be necessary for smaller companies.

In summary, our "OEE Sniffer Dog" solution represents a tailored, cost-effective, and user-friendly alternative to the established systems of Forcam, Bosch, or Siemens, specifically designed to meet the needs of smaller companies and make their production processes more efficient.



3. connection to the cloud (in preparation)



In the future, the data from each IO device can also be stored in the cloud or in the local company network. All production data is then available in a Microsoft Azure database. The customer can then evaluate his data himself using Microsoft Power BI tools or JavaScript.



4. Screenshots

Aktuelle Produktion

OEE SNIFFER DOG **10264 | 0** **15:02**
26.07.2023

Produktion aktiv

Gesamt **600** Aktuell **16** Rest **584** P/min(60s) **16** P/min(AVG) **5.33** OEE **53.3%**

Auftrag Produktion Reinigen Reparatur Alarm

Auftrag ist aktiv **15:01**
26.07.2023

Kunde **floormaster** Version Nummer **0.9.1**
Strasse **Mayenerstrasse 44** Typ **Professional**
Ort **53474 Bad Neuenahr** PLC **eaton**
Land **Germany** Aktiviert **2023-07-26T12:46:46.278Z**

Sicherungsintervall Zeit: **1 Minute**
Warnung Max Zeit ohne Impulse Zeit: **1 Minute**
Störung Max Zeit ohne Impulse Zeit: **1 Minute**

Modus **Manual** **SPEICHERN**

Aktuelle Diagnose

OEE SNIFFER DOG **Auftrag ist aktiv** **15:04**
26.07.2023

Auftrag: **10264 | 0** Ziel: **600** Gesamt: **25** Rest: **575**

AKTUELLER AUFTRAG **ANDEREN AUFTRAG WÄHLEN**

Nicht Angemeldet
 Warten auf Pakete
 Produktion aktiv
 Reinigen aktiv
 Reparatur aktiv
 Warnung Pakete
 Fehler Pakete
 Externer Fehler

Zustand	Zeit	Anteil
Nicht Angemeldet	00:00...	0%
Warten auf Pakete	00:00...	0%
Produktion aktiv	00:02...	50.79%
Reinigen aktiv	00:00...	0%
Warnung Pakete	00:01...	31.5%
Fehler Pakete	00:00...	17.72%
Externer Fehler	00:00...	0%

Verfügbarkeit Leistung OEE

Zeit in Stunden 8

No Data

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Kind regards Franz Keuler (Dipl. Ing E-Technik)

