Concentration

Temperature

Operating time

Level

Flow

Vibrations

Keep the Machine Running

System for maintenance management digitization

Comprehensive information on equipment and machinery maintenance, retrieved instantly and accessible even remotely.

www.mykmr.ro

Keep the Machine Running

KMR is a modern system for streamlining maintenance and managing it, designed for planning, and organizing the maintenance activities flow of equipment and machinery in a factory, company, or office building.

KMR integrates IoT technologies and can automatically retrieve from equipment or machinery useful information for maintenance management such as: operating time, vibrations, temperature, level, flow, or concentration.

This kind of software system is an integral part of industrial digital ecosystems Industry 4.0. The main role of the maintenance management system is to effectively organize the whole maintenance activity and to provide the responsible personnel with control over equipment, materials, activities, and costs of maintenance.

The benefits of installing the KMR system

Effective management of machinery and equipment

- Reduce downtime
- Corrective maintenance
- Preventive and predictive maintenance
- Plan maintenance activity
- Record operating hours

Effective management of technicians' activity

- Assign tasks (tickets, requests)
- Access resources: service manual, intervention history, similar situations etc.
- Alerts, notifications, and real-time information
- Mobility – web interface (laptop, tablet, phone)

Specific reports on

- Tasks assigned to technicians
- Materials (top costs or usage)
- Machinery (costs, overhauls, number of overhauls)
- Overhauls and interventions (top costs, delayed or planned)

Budget control

- Plan necessary materials
- Cost control
- Stock control

⊙ **Comelf**

"The main advantage we gained with the deployment of the maintenance management system was that it helped us simplify the process of submitting maintenance requests. It helped us solve the problems of tracking work activities, spare parts management, and interventions history."

General Manager - Cenușă Gheorghe

10 reasons your business needs a KMR system

1

Planning, monitoring and effective deployment

Effectively store information related to interventions or planned maintenance works without the need of physical documents.

2

Cutting costs

Increase the reliability of equipment by up to 50%, of work orders by up to 15% and reduce expenses by streamlining costs by up to 20%.

3

Maintenance, machinery and equipment management

Add to the database all the machinery and equipment subject to maintenance along with their specific information: name, inventory number, location, warranty period, pictures, additional information.

4

Preventive and predictive maintenance

Ensure uninterrupted operation of the equipment and reduce downtime. Thus, prevent malfunction occurrence and reduce dynamic and static components wear. How? By monitoring equipment and their behavior in time.

5

Control over activity

Get an overall view, but also specific information on the deployment activities in the maintenance process, this being correlated with a total control over any activity and the costs involved.

6

Materials, overhauls, interventions, equipment and machinery management

Real-time access to up-to-date information about materials needed for maintenance or repairing (name, manufacturer, stock, price, etc.). Lists can be imported and exported from / to Excel spreadsheets. Maintenance planning and management for each piece of equipment: maintenance type, responsible technician, date, alert, status, diagnosis, tasks, materials used, costs, etc.

7

Ticketing module

Reduce response time by assigning work tasks to technicians through tickets. Simple scan of a QR code integrated in the KMR application provides authorized technicians instant access to information about certain equipment which are introduced into the system.

8

Archiving and activity history

By archiving the materials needed for the maintenance activity, you can have quick and easy access to information related to overhauls and interventions history for each piece of equipment. You can then determine the need for materials and works based on concrete historical data.

9

Notifications and SMS or e-mail alerts

Get real-time access to information and decisions which are transmitted accurately and in detail to the right people at the right time.

10

Specific reports

Perform analysis and make decisions based on specific reports generated by the system. Vital information for: management, economic department, maintenance department.

KMR and Industrial IoT

KMR can integrate Internet of Thing technologies and focuses on automatic retrieval of useful information from equipment:
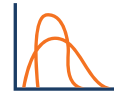
Operating time	**Vibrations**	**Temperature**	**Level**	**Flow**	**Concentration**

KMR Industrial IoT can automatically retrieve data from sensors and networked devices, this representing a new stage of the automation concept. This system allows data collection, sharing it to a central server and results analysis to obtain specific reports on the necessary activities related to preventive and predictive maintenance.

This contributes to:

• Analysis of complex actions that have not been noticeable so far
• Increased efficiency and reaction time in production
• Useful resource management
• Increased employee productivity due to information retrieved from multiple devices which communicate with each other and download the interconnected data into a central system
• Improved quality and quantity of data collected, as well as improved reliability of assets and streamlining of maintenance resources
• Display of collected data in an easy-to-read way through dashboards and graphics
• Secured data sharing with key staff outside the organization. When the maintenance team and external technical experts have access to common data, can solve problems faster and can make changes to help reduce machine downtime

Case study

Implementation of KMR for monitoring the operating parameters at ETNIS SRL

ETNIS company, which covers the complexity of activities carried out through the entire process of creating a heating installation, wanted to deploy a solution that would allow them to follow and control the parameter values in the heating systems.

To meet the objectives of the project, it was necessary to integrate the existing sensors intended for temperature values identification with the solution for operating time monitoring and transmission of measurement results to a data storage and analysis platform. In relation to the customer's requirements, Quartz Matrix team proposed as an optimal solution the KMR IoT system, developed for automatic retrieval from equipment and machinery of useful information for maintenance management: operating time, temperature, equipment condition (functional / fault) etc. Thus, the system for maintenance management KMR (Keep the Machine Running) offers ETNIS a level of unprecedented visibility over the monitored equipment. Monitoring and maintenance management application is designed for receiving large streams of data from sensors and allows their digital transformation into simple information, easy to use in real time.

Quartz Matrix team retrieved from both the existing and newly installed sensors approximately 180 parameters that have been optimized and tested. In addition to parameterization and data reading software KMR, Quartz Matrix also provided management services for authorized electrical execution project and communication project.

Through the parameters provided by the sensors, which are monitored in the KMR platform, where data is processed and interpreted, the company ETNIS achieved its maintenance management objectives. The system managed to turn data into high value-added information for the company, offering the possibility to make decisions based on concrete information.

What are the main benefits of IIot technologies integrated into KMR system?

The greatest benefit brought by the integration of Industrial IoT in KMR is related to the **management of predictive maintenance.** Instead of routine inspections based on a schedule and components replacement based on it, predictive techniques monitor the equipment and send a notification when a fault occurs and a part must be replaced, for example. The sensors built into equipment detect disturbances and trigger an alarm when safe operating limits are reduced. When an effective predictive maintenance strategy is implemented, service is performed only when there is a real need, thus reducing the costs with parts and workforce associated with replacements.

The availability of collective data from equipment, integrated in a single virtual network, provides maintenance managers **the opportunity to analyze collective data for generating better predictive analytical models.**

Availability, reliability, and other key performance values, such as the average time between faults and the average repair time, can be calculated automatically by the system and showed on dashboards. This eliminates the human element in registering all downtime, ensuring the accuracy of the data.

If an equipment has a fault, **emergency data from various sources can be collected and analyzed in real time.** Repair options can be taken automatically by the system, and the actions can be recommended to the technician if necessary.

Effective stock management is another benefit of IIoT integration. Thus, we can reduce downtime and have more control over the maintenance budget. The stock will be analyzed and monitored by the system and thus it will be ensured a stock only with the necessary parts.

Time efficiency is another asset of Industrial IoT. Thus, we can reduce unnecessary visits to remote locations. Technicians can get information about the exact location of the equipment that needs maintenance, problem description and spare parts list required for repairing. Time and costs associated with emergency repairing are extremely much reduced.

KMR Roadmap

Year	2015	2017
Version	KMR 1.0	KMR 2.0
Functionalities	Basic version for maintenance management	Overhaul schedule Service provider module **Ticketing module**

Year	2018	2021 - H1
Version	KMR 3.0	KMR 4.0
Functionalities	Spare parts request module **Sensors management module** Sensors retrieval/reports **Work procedures module** Status module Alarms	Roles and teams module Departments module Clients/Beneficiaries module Waste module Contracts module Acquisition orders module

Year	2021 - H2
Version	KMR 4.1
Functionalities	**Preventive maintenance module** **Corrective maintenance module** Timetable module Planned budged module **Sensors / IoT module** Chat module

Clients using KMR

Production

Nuclearelectrica · aviva · Casa Noastră · Soehner Romania

Karelia HARDWOOD FLOORS · LEMET entuziasm și pasiune · δ Delta ENGINEERING

Food

AGROPAN · PANOVIA Patiserie gustată de români · RAP confectionery

AGRANA Research & Innovation Center · AQUA CARPATICA · LiDaS

Maintenance

TEHNOPLUS® MEDICAL

FEQS · ETNIS

Medical

Antibiotice a+

SANADOR

Heavy industry

Comelf

elpreco

Textile

Artifex

Automotive

NBHX ROLEM

Chemical industry

swarco

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