THE 21ST INTERNATIONAL OPERATIONS & MAINTENANCE CONFERENCE IN THE ARAB COUNTRIES

Autonomous Decision Support Based on Artificial Intelligence Techniques for Maintenance Processes

Prof. Dr. –Ing.
Mohammed Abdulaziz

Rhein Neckar College
Germany

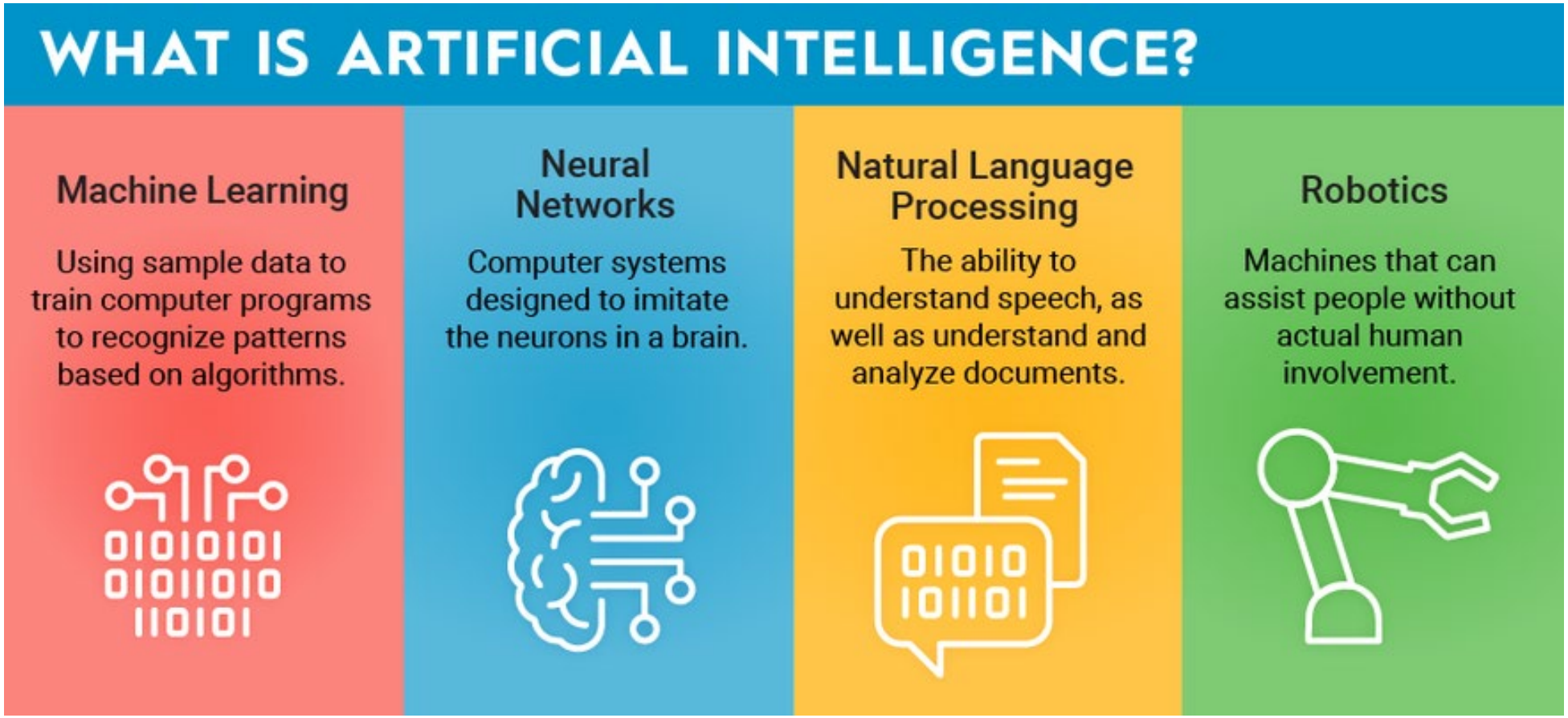
Partner of
QTC
Saudi Arabia

#OmaintecConf

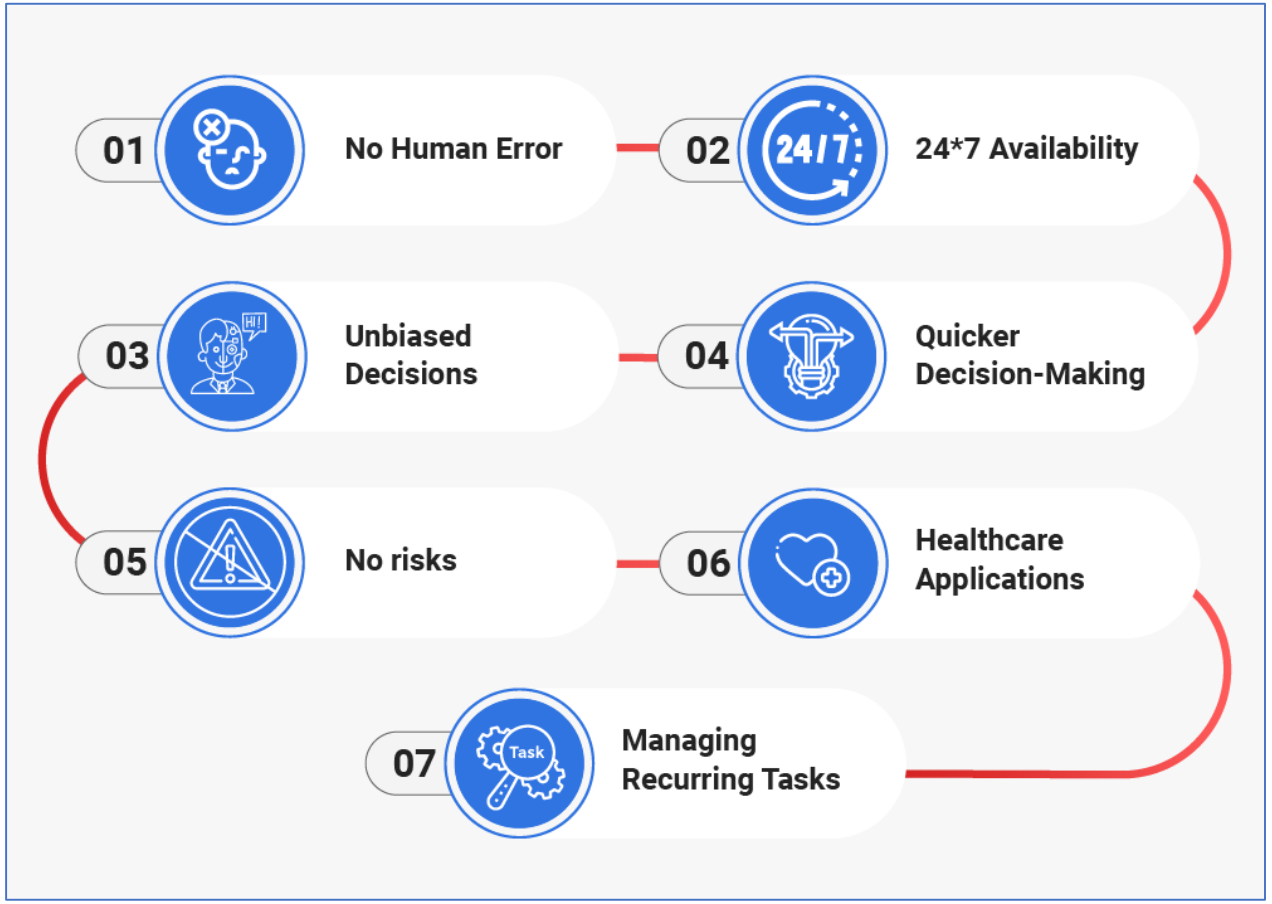
An Initiative by

Organized by

What is AI? and Why do we use it?



What is AI? and Why do we use it?



What is AI? and Why do we use it?

- Traditional maintenance **struggles** under modern production demands.
- New tech shows promise for better maintenance but needs **careful evaluation and strategy**.
- Current **decision-support** tools for maintenance are **limited and outdated**.
- **Future factories** need adaptable, **intelligent maintenance with AI** for automated decisions.

Study Goals

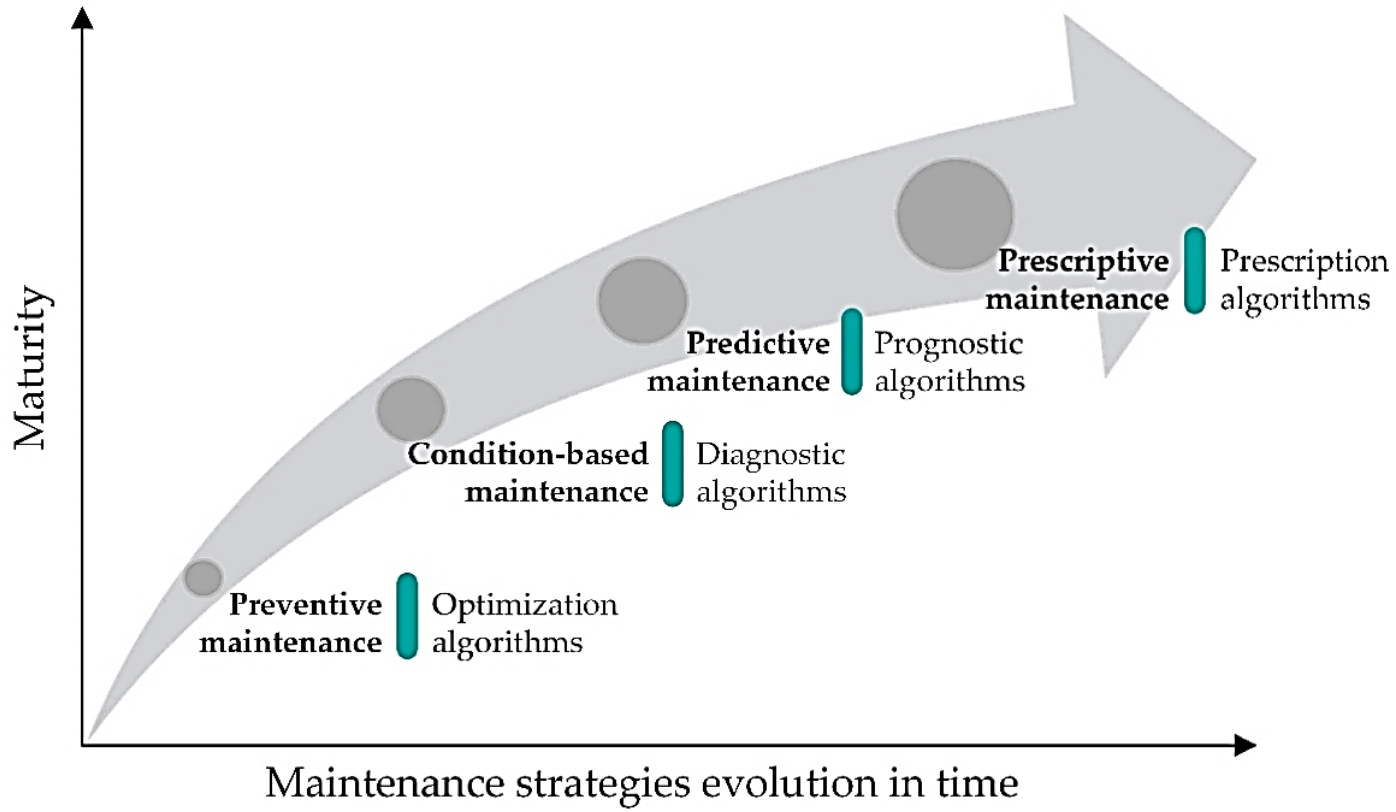
Survey the **latest intelligent maintenance systems** using descriptive, predictive, and prescriptive approaches.

Analyze how these approaches **impact maintenance policies** and drive innovation.

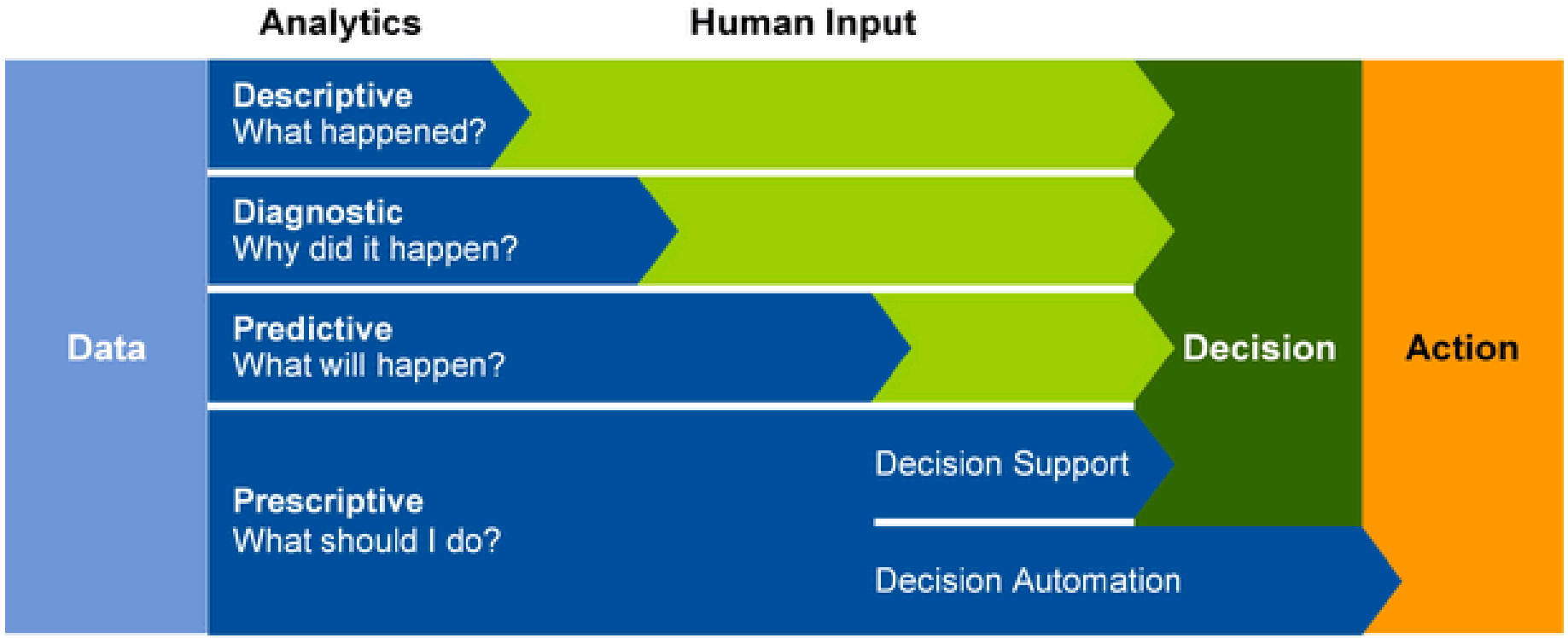
Fill a knowledge gap by exploring **cutting-edge methods** in each approach.

Provide **insights and challenges** associated with adopting these novel policies.

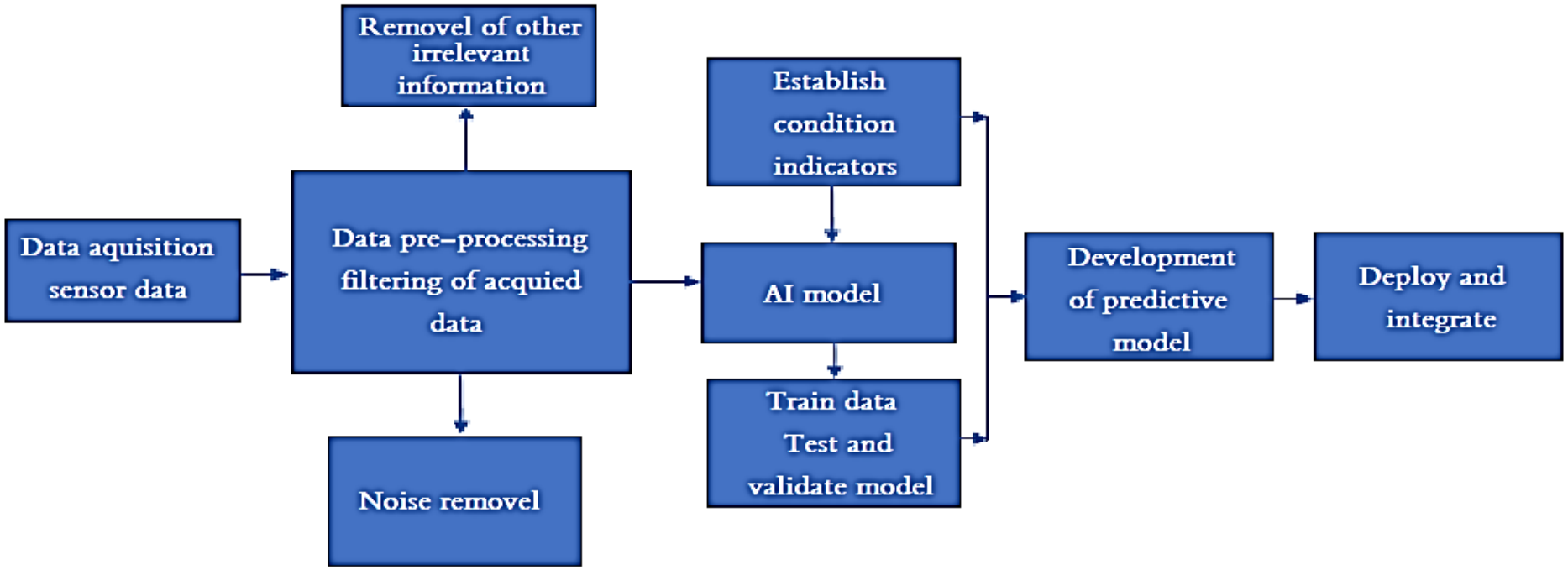
Knowledge-Based Maintenance Strategies



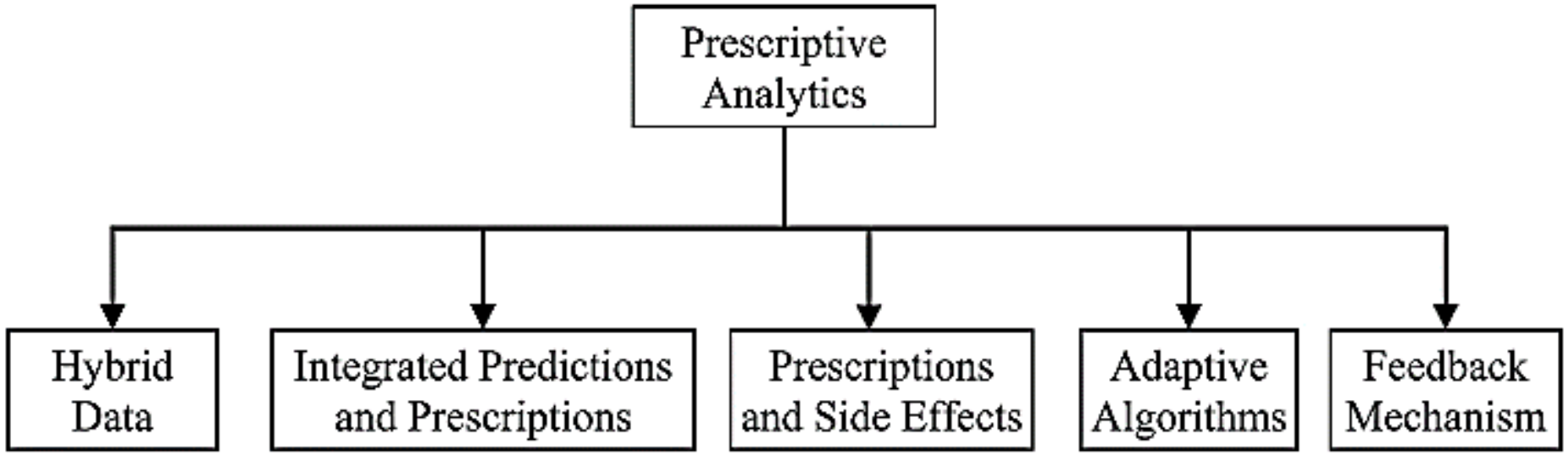
Predictive and Prescriptive ML Algorithms



Integration of AI and predictive maintenance technologies



Prescriptive analytics features



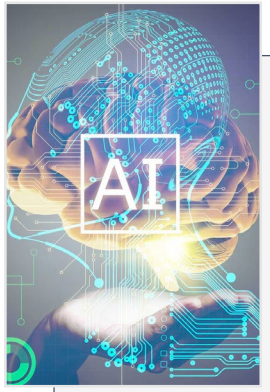
Maintenance Decision Support Models

- Recent maintenance models focus on aiding decision-making through data analysis and integration from various sources.
- Several studies showcase innovative models for predictive maintenance and scheduling, but they face limitations:

1. Lack of learning and predicting process behavior over time.
2. Difficulty in generalizing to other problems (limited scope).
3. Inefficient assessment and feedback loops for improved planning.
4. Outdated data analysis methods needing improvement for advanced tasks.

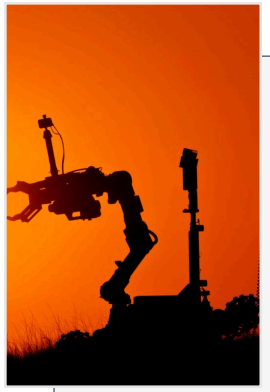
Conclusions

Review of advanced maintenance systems



AI boosts system reliability and cuts failures: predictive maintenance with AI can increase availability by 20%, decrease inspection costs by 25%, and maintenance costs by 10%.

Machine learning identifies and classifies faults automatically.



Maintenance models need improvement for autonomous AI-based decision support.

I’m convinced now! and?

MicroMasters DIPLOMA

SHORT COURSES

80 20

AI

Data Analysis

AI Maintenance Professional

Automated Inspections

ML

RHEIN NECKAR COLLEGE

Germany

قمم التخصص للتدريب

Saudi Arabia

In Cooperation with a wide range of world-class universities. For examples:

- **Harvard University**
- **Queensland University**
- **Maryland University**

And Membership/Partnership of:

- **IHK – Germany**
- **TÜV – Germany**
- **PMI**
- **KPI Institute**

#OmaintecConf

OMAINTEC CONFERENCE EXHIBITION 2024

THE 21ST INTERNATIONAL OPERATIONS & MAINTENANCE CONFERENCE IN THE ARAB COUNTRIES

THANK YOU!

#OmaintecConf

An Initiative by

OMAINTEC
المجلس العربي للتشغيل والصيانة
Arab Operations & Maintenance Council

Organized by

EXICON.
International Group
مجموعة أكزيكون الدولية