

## ExpertSys2 – part of EVO-MTI

Development of an expert system for the design and evaluation of exoskeletons

### BACKGROUND

Assistive technologies are being used in more and more life situations. One approach here is exoskeletons, which, depending on their design, are intended, for example, to relieve the strain on the workforce during physically demanding activities or to support users during rehabilitation. Corresponding systems must be designed with regard to the support situation - for example physio-logical requirements, movement sequences, intended use and general conditions. The development and evaluation process of corresponding systems is carried out using simulation, design and evaluation methods and tools, as well as on the basis of individual skills and experience. The overall EVO-MTI project is developing a digital environment for the design, evaluation and optimization of human-machine systems with humans in the power flow, human-technology interaction (HTI) and system components such as physical interfaces for power transmission.

### FOCUS OF WORK

Within EVO-MTI, different physical and virtual simulation models are combined to represent various system components of the human-machine system. This generates diverse data and information that must be integrated for the evaluation and development of physical assistance solutions. In the ExpertSys subproject, a higher-level expert system is being developed to systematically capture, link, and use these data for analysis and decision-making processes. This includes the development and implementation of a reference architecture, a structured knowledge base, and a database concept. The system is evaluated using different application scenarios, for example for the comparative assessment of support concepts for overhead work.



### KEY MESSAGES

The expert system forms the decision-making and integration component within the EVO-MTI development and validation environment. Its goal is to bring together heterogeneous data from different investigation and evaluation environments in a shared knowledge and data base and to use them for the assessment of physical assistance solutions. In addition, AI methods are planned as a tool for the evaluation, design, and data-driven analysis of physical assistance solutions. The system is evaluated using different application scenarios.

#### Projekträger

Dtec.bw – Zentrum für Digitalisierungs- und Technologieforschung der Bundeswehr

#### Förderkennzeichen

EVO-MTI - EU (NextGenerationEU)

#### Laufzeit

01/2026 – 12/2026

#### Projektpartner

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