

Virtual workplace design for the value-added deployment of employees with restricted performance



3D Layout visualized in ema Work Designer

Challenge

The task in the project was a redesign and transfer of several decentralized pre-assembly workstations of the axle production into a new central production area of the Daimler Truck AG. The primary objective was the analysis of a possible integration of employees with restricted performance into an existing plant structure with an overall redesign based on a digital twin of seven workstations with the help of digital planning tools.

Implementation

In the first step all necessary data has been recorded in an on-site study. In addition to the information of the required components (e.g. weights, type and quantity of required containers) also dimensions and functionalities of used devices at the work stations were collected. Based on this information the software solution ema Work Designer was used to create an initial digital layout concept with simulation of work processes, equipment and basic workstation dimensions according current customer guidelines.



Example of a redesigned workstation

The next step was the iterative detailing of the initial scenario according to the requirements of capability-appropriate workplaces. This process step included not only the adaptation of the material flow (e.g. reduction of the load handling of SLC/LLC) but also the technical redesign of e.g. fixtures and load manipulators. Afterwards the assembly processes of the individual workstations were simulated and further potential for ergonomic improvement were identified.

The iterative optimization of the individual workstations had been realized with a continuous exchange of information based on digital workshops together with the departments of planning, production and logistics of the customer. Based on the coordinated solution as a digital simulation technical specifications were created for each workstation. The first workstations were set up in a prototype workshop then.

Result

The new central pre-assembly area enables the value-added integration of employees with performance restrictions. The targeted design and continuous optimization of the workplace layouts with the participatory involvement of all affected production and specialist departments ensured the acceptance of the proposed concept.

In addition to the ergonomic improvements potentials in production time and walking distances were identified by the redesign.

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Engineering and Consulting for the Industry

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We also offer individually tailored workshops, interactive on-the-job training and customer-specific training for CAE, material science & manufacturing processes, work planning & ergonomics basics, LEAN & value stream analysis as well as for virtual production planning and digital mock-up. The modern company headquarters in a historic building offers our interdisciplinary teams an inspiring and modern equipped environment and is therefore the ideal place for research and development at the highest level. Thus, imk has already proven in numerous projects to be a competent, flexible and reliable research partner of public institutions and industrial partners on a national and international level.

About Ergonomics Consulting

The demographic change in our society has long since arrived in manufacturing and ergonomic workstations can significantly increase productivity, quality and flexibility in production for our customers. A decisive competitive factor is to design manual workflows effectively and ergonomically at the same time.

With competences in product & process design, virtual ergonomics, ergonomic evaluation & measurement as well as consulting & training, we support the ergonomic design of products and processes, from concept to serial production!

