Mixed Reality - XR

Playful learning for more motivation

Problem definition

In the industrial sector, many companies have to deal with long training periods, a low risk awareness and the inefficiency of rarely performed or highly complex shop floor procedures. However, these deficits can have a strong impact on the company and lead to defective products, disruptions in operations or increased personnel deployment. For example, insufficient training leads to nonconforming work and disruptions in operations. In addition, there is a considerable risk of injury to employees if awareness of hazards and rules is not adequately communicated. New technologies like Virtual Reality (VR) and Augmented Reality (AR) hold enormous potential for addressing these problems and include additional benefits, such as increasing the intrinsic motivation of personnel. However, many companies are unfamiliar with these technologies or lack the expertise to apply them.

Vision

Our vision is to realize the fusion of reality and the virtual world e.g. in production control, workplace design and training. In addition to increases in effectiveness, the motivational aspects of serious games and gamification can be made available to companies with the help of XR technologies such as VR or AR in learning processes and operational workflows.

Research objective

- Increasing the efficiency and effectiveness of (learning) processes in the logistics environment through XR
- Motivating employees through the use of XR technologies and supporting them in the context of digitalization
- Optimization of intralogistics processes by displaying real-time information

Mixed-Reality (XR)

Mixed reality (XR) refers to the augmentation of the real environment with virtual elements and vice versa. The focus of the XR concept is therefore on the mixing of the real and virtual worlds. Two particularly relevant forms are the technologies »Virtual Reality (VR)« and »Augmented Reality (AR)«.

Virtual Reality (VR)

VR is a virtual world that a user views and interacts with by using a VR headset (glasses with built-in screens, one for each eye). The real world is completely hidden. VR is suitable for e.g. virtual training and learning phases, especially through a playful approach, with so-called serious games.

Augmented Reality (AR)

AR is the reality that is enriched with virtual information, e.g. via transparent displays in glasses, so that it appears as if the information is present in the real world (e.g. a virtual clock on the real wall). AR offers, for example, the possibility of supporting picking processes by displaying information on the shelf or to facilitate the maintenance of facilities through technical assistance.

What benefits does »Mixed Reality« offer your company?

- Digital support of processes and production controls lead to increased effectiveness, efficiency and reduced error rates.
- Gamification leads to increased motivation, satisfaction and performance
- Cost / time savings compared to classical training methods
- Work can be carried out by untrained personal as AR can visualize directions from other IT systems or human experts

Our services

- Development and implementation of XR concepts to support the operational business in your company

- Conception of learning and training content for a serious game tailored to your company
- Licensing and individualization of existing solutions
- Evaluation of business cases for XR

Our products

- **PackNick VR:** Learning game for general packing processes including interaction with a Warehouse Management System (WMS)
- **LiftNick VR:** Forklift simulation to train the awareness of rules and process knowledge in your own warehouse
- **PickNick VR:** picking training with optional integration of a pick-by-voice system
- **InGo VR:** Training to internalize the goods receipt process including quality control

Selected references

- **Industry partner:** Intralogistics system vendor
  Mission: Virtual reality training for picking with a pick-by-voice system
  Results: Efficient learning of the picking process and the operation of a pick-by-voice system

- **Industry partner:** Schenker AG
  Mission: Forklift training in virtual reality with consumer hardware for intralogistics
  Results: Increased awareness of safety regulations and precautions, improved knowledge of the warehouse layout and routines, 71 % of users are enthusiastic

- **Industry partner:** DEKRA Akademie
  Mission: Development and implementation of a VR training in logistic training measures for low-skilled workers
  Results: Training for the incoming goods process including quality control for productive use

Software Bundesverband IT-Mittelstand Made in Germany

100% Service Quality Future

In the pursuit of the highest product quality, we have subjected our PackNick and InGo products to official tests and received the prestigious ‚Software Made in Germany' seal in 2023.

Contact

Stella Kolarik
Team Digital Assistenz
Tel. +49 231 9743-229
stella.kolarik@
iml.fraunhofer.de

Arnd Ciprina
Head of Team Digitization
Tel. +49 231 9743-243
arnd.ciprina@
iml.fraunhofer.de

Fraunhofer Institute for Material Flow and Logistics IML
Joseph-von-Fraunhofer-Straße 2-4
44227 Dortmund
www.iml.fraunhofer.de