

The Industrial Machinery market (Industrial equipment, machine tool) has never been so complex. Machinery companies are requested to continuously innovate and optimize their products to face to increasing global competition and market demands.

Virtual Reality was born more than 10 years ago and has now reached the maturity to help industrial machinery manufacturers face those challenges, by creating immediate value for their business. The benefits identified by customers today are numerous: accelerated time-to-market, enhanced sales and marketing approaches, increased agility in the product development process, etc.

There are very different uses of Virtual Reality in this industry: collaborative and immersive design reviews (reachability, visibility and usability studies), evaluation and optimization of assembly and disassembly sequences, verification of resources and tooling for both manufacturing and maintenance, support of documentation and workflow animation/training, etc. However, all these different uses of Virtual Reality have one common point: they help actors of this industry to handle an increasing number of decision points and parallel workflows with more agility and efficiency.

What is Virtual Reality?

Virtual reality is a technology that allows people to interact with a nonexistent, digital, computer-simulated 3D environment. This technology is a combination between Virtual Reality software, special stereoscopic displays and advanced tracking devices. This combination of technologies, once handled by stakeholders, provides a highly-immersive, interactive, real-time/real-size experience of any product.

Today, numerous Industrial machinery actors use ESI's Virtual Reality solution, IC.IDO, as the cornerstone of their product development process (Jungheinrich, Bausch+Stroebel, Herrenknecht, Oerlikon, Optima Group, Voith, etc.). Despite a strong representation in this industry in particular, IC.IDO is also extremely well represented in the Ground Transportation industry (John Deere, Jaguar Land Rover, Caterpillar, BMW, Ford, etc.) and in the Aerospace & Defense industry (Boeing, EADS, Rheinmetall, etc.).



John Hayes, CEO of Engineering.com, gives us a concretely-illustrated example of what can be performed with Virtual Reality: *"At life size scale you get the feeling of being right on the plant floor. We could walk through the steps that an operator would go through to install a battery, ratchet in a bolt and install a gas tank. This takes the concept of virtual prototyping one big leap further – all the way through assembly and even to maintenance"*.

Jungheinrich, leading international supplier in the field of material handling equipment, warehousing technology and material flow technology, performing virtual reachability studies to anticipate the maintenance of a new forklift model.

“Leveraging ESI’s leading Virtual Reality technology significantly helps us optimize our development processes. IC.IDO enables us to modify processes and developments collaboratively with our customers, with the common objective to improve on performance, enhance quality and decrease development time,” Gebhard Lehmann, Vice-Chairman of the Board of Management, of Herrenknecht AG

Herrenknecht AG is the only company worldwide to deliver tunnel boring machines for all ground conditions and in all diameters – ranging from 0.10 to 19 meters. The Herrenknecht product range includes tailor-made machines for transport tunnels, supply and disposal tunnels and additional equipment and service packages. Furthermore, Herrenknecht manufactures drilling rigs for vertical and inclined shafts as well as deep drilling rigs.

Herrenknecht uses ESI Group’s Virtual Reality solution to perform ergonomics studies and complete security assessments, visibility and reachability studies, real-time simulations of wires and hoses, and assembly & disassembly analyses.

Using IC.IDO's ergonomic and intuitive software environment, sales, marketing and technical staff from Herrenknecht can share models with their clients’ decision makers and influencers – communicating naturally with executives, engineers and operators; assuring a common understanding of current and future products and avoiding the misunderstandings and misinterpretations often encountered when relying on drawings and scale models. Thanks to IC.IDO, the distributed players in a project are able to use a shared 3D model as a platform for real-time reviews, enabling constant communication and faster iterations from the earliest stages in the product development process.

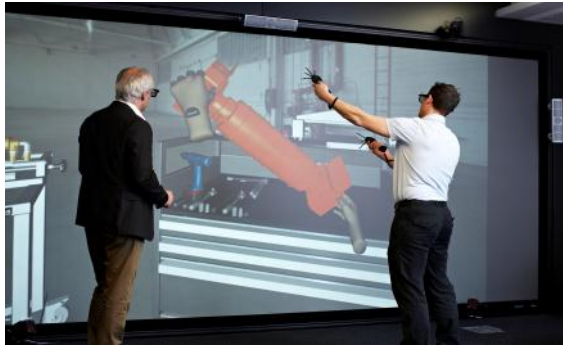
Massive amounts of 3D data from different sources (including Herrenknecht, their clients and subcontractors) can be loaded rapidly into one environment, facilitating regular updates and assuring that teams are always current with the latest design progressions. By making the right decisions at the right time, Herrenknecht reduces lead times and product development costs.

“Using IC.IDO in this project allowed us to meet our deadline and to deliver the expected quality in a lead time about 15% shorter than for other comparable projects.” Patrick Gabler, Engineering Project Manager, GABLER

GABLER is an innovative company in the manufacturing industry supplying complete solutions to an international clientele. They differentiate themselves with expertise in their field: the design, development and building of production lines for chewing and bubble gum, chewy candy, pharmaceutical pellets, sugared almonds and many other products. Their customers include Brandt, Ferrero, Hershey, Lindt & Sprüngli, Lotte, Mondelez International, Novartis, Tootsie Roll, Watson Pharmaceutical, etc. They produce machines in-house and develop specific manufacturing lines adapted to their clients’ needs. On a day-to-day basis, GABLER faces tough international competition and needs to deliver the best and safest possible production lines to their customers in the shortest time possible.



Herrenknecht engineers performing a design review using IC.IDO



Virtual handling of a component with IC.IDO. IC.IDO also allows managing tooling aspects in the context of an assembly/disassembly analysis.

can check every single corner of the manufacturing line, remove any piece of the machine, and replace it by another. Thus, we are able to check manufacturing feasibility and serviceability from the earliest steps of the product lifecycle management,” declares Patrick Gabler, Engineering Project Manager.

One of GABLER’s recent projects consisted in engineering a new chewing-gum manufacturing line together with their customer in only two weeks. It was a fixed price project – no changes would be paid for. The only way to meet this two weeks deadline was to ensure the most efficient communication between GABLER’s Engineering teams and the client’s Food Process Engineers. In order to meet this two weeks deadline, all meetings were held in GABLER’s facility in their IC.IDO virtual project room. The common goals of these reviews were to manage risk assessment while ensuring adequate safety for the workers and hygiene for the products. GABLER discussed all critical topics with their customer using the IC.IDO Virtual Reality-based system, enhancing collaboration, reducing risks of errors and improving processes quality. Besides reducing development times by 15%, IC.IDO assists GABLER in understanding in detail their clients’ supply chain and to serve different industries and organizations. The unprecedented degree of product understanding provided by IC.IDO clearly absorbs decreasing margins in the machinery industry.

To increase their competitive advantage, GABLER decided to supplement their processing solution with ESI’s Virtual Reality solution IC.IDO to make faster and more accurate decisions. Indeed, real-time/real-size presentations and fully immersive engineering reviews allow GABLER to offer better and safer solutions to their customers. *“Today we create our 3D data and upload them into IC.IDO to get a better insight of what a production line will*

look like and how it will be operated. Some of them are over 60 meters long, with complex machines responding to complex processes. With IC.IDO we



Checking accessibility with a virtual mannequin

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ABOUT ESI GROUP

ESI is a pioneer and world-leading provider in Virtual Prototyping that takes into account the physics of materials. ESI boasts a unique know-how in Virtual Product Engineering, based on an integrated suite of coherent, industry-oriented applications. Addressing manufacturing industries, Virtual Product Engineering aims to replace physical prototypes by realistically simulating a product's behavior during testing, to fine-tune fabrication and assembly processes in accordance with desired product performance, and to evaluate the impact of product use under normal or accidental conditions. ESI's solutions fit into a single collaborative and open environment for End-to-End Virtual Prototyping. These solutions are delivered using the latest technologies, including immersive Virtual Reality, to bring products to life in 3D; helping customers make the right decisions throughout product development. The company employs about 950 high-level specialists worldwide covering more than 30 countries. ESI Group is listed in compartment C of NYSE Euronext Paris.