Drive Innovation with Virtual Prototyping

Software and Engineering Services

www.esi-group.com
Dear Reader,

As an industrial player in today's globally competitive environment, you cannot escape the challenge of delivering more innovative products at a lower cost, faster, and with increased reliability.

Our goal at ESI is to give you, no matter your industry sector or company size, the ability to meet this challenge by virtually manufacturing, assembling and testing physically realistic components and complete virtual products – essentially building your Virtual Prototype.

Leveraging over 40 years of expertise, working hand in hand with our customers through engineering services, ESI develops and delivers the right solution for the job to support your innovation.

With a Virtual Prototype that is both multi-domain and multi-physics, you can assemble components that make physical sense, share models that have the right level of information, and conduct virtual tests, with multiple teams working in parallel and collaboratively. Thanks to ESI's platform, you have access to the right physics at the right time.

I hope you enjoy reading about some of ESI's recent milestones and examples of remarkable achievements in co-creation with our customers, who are truly our partners in making Virtual Prototyping a reality.

Alain de Rouvray,
Chairman & CEO

Quick Facts:

ESI performed the first ever car crash simulation in 1985 – over 30 years ago. Since then, ESI has developed a unique expertise in manufacturing, testing and experiencing products – all virtually.

Today, ESI counts over 2000 customers: major players in the automotive, aerospace, energy, defense, electronics, heavy industries, consumer goods, biomedical, and other sectors. ESI partners with best-in-class OEMs Renault, AREVA, AVIC and our longest standing customer, Volkswagen.

The company employs about 1100 high-level specialists worldwide to address the needs of customers in more than 40 countries.
In most manufacturing companies, CAE teams are mapped to represent different engineering fields. Take a car manufacturer, for instance: the design team will hand over their concepts to the crash & safety department, as well as the other simulation departments who will look into Stiffness & Strength, NVH & Durability, Acoustics, Drivability, Comfort, and so on.

By working in silos, engineers soon face design trade-offs, as addressing the requirements of one field might be detrimental to others. Teams will go back to the design board numerous times until reaching an acceptable compromise.

ESI’s Virtual Prototyping approach solves this absence of value by using a Single Core Model: by working on the same model of a car’s system or sub-system, teams can work concurrently. They can get instant answers to their ‘what if’ questions and investigate ideas outside the box very quickly – promoting greater innovations.

Using its deep knowledge in material physics, ESI has developed Virtual Manufacturing software that helps manufacturers simulate their future products, that the product tested virtually represents the product as built – not merely as designed. Equipped with Virtual Manufacturing and Testing capabilities, engineers can ensure early feasibility and pre-certify their products virtually, staying ahead of competition.

Once teams have created their Virtual Prototype, they bring it to life in real-time, real-scale, in immersive 3D, using Virtual Reality.

What’s next? ESI is continuously growing to support your needs in a rapidly changing environment. In this new internet of things, Virtual Prototypes are becoming smart. They can make autonomous decisions thanks to meaningful data analytics.
ESI is shaping the future of Virtual Prototyping

Disruptive digital technologies are rapidly and profoundly changing the way engineers work!

ESI is building new paths to seamlessly connect your virtual prototypes with the latest technologies: Systems Modeling, Advanced Driver Assistance Systems (ADAS) & Autonomous Driving, the Internet of Things, Data Analytics, Machine Learning, and Cloud Computing.

Launch of ESI Cloud for Cloud-based CAE Modeling

Following the acquisition of Ciespace’s technology assets, ESI Group launched ESI Cloud. ESI’s Virtual Prototyping solutions are now available in Cloud/SaaS mode. The platform creates considerable additional value to ESI’s existing industrial customers, offering a convenient, mobile, collaborative solution. ESI Cloud is also a powerful vector to democratize ESI’s Virtual Prototyping solutions, now within easy reach for small and medium businesses. Register now for a free trial at cloud.esi-group.com

ESI Strengthens its Solutions for Advanced Driver Assistance Systems (ADAS)

Having acquired CIVITEC and its software Pro-SiVIC™, ESI is equipped with a breakthrough technology dedicated to the development and integration of embedded Advanced Driver Assistance Systems (ADAS). ESI Pro-SiVIC™ enables industrial players to develop perception assistance systems from the design phase to the final testing. The software takes into account the interactions of a vehicle, or any other industrial product, with its immersive 3D environment.

Leveraging the Power of Data Analytics and Machine Learning

With the acquisition of Mineset Inc., ESI customers benefit from a web-based solution for data analytics and Machine Learning, complementing the recently integrated Picviz Labs (now ‘ESI INENDI’), a visual analytics expert specialized in cyber security. This combination of talent and technology contributes to revolutionize the field of simulation data analytics, with extensions such as predictive maintenance and cyber security.

ESI Extends its Offering in Systems Engineering

By acquiring ITI GmbH, ESI adds to its portfolio the leading solution in fast and accurate system simulation: SimulationX. This acquisition allows the bridging of virtual prototypes in a detailed 3D-4D space with the 0D-1D space, positioning ESI further upstream in the industrial product manufacturing chain.
The Industry Standard for Ground Transportation

Customers in Ground Transportation make up 53% of ESI's portfolio, including the world's top 10 OEMs and many of their tier-1 and tier-2 suppliers. ESI's dedicated software and team of engineers empower you to reduce product development time, cut costs, and push the limits of innovation.

MAN and the University of Applied Science Upper Austria Design a Truck Assembly Line Using ESI IC.IDO

“With rapid data preparation in virtual reality workshops, powerful assembly functionalities and user friendliness, ESI’s IC.IDO proved to be the right choice for this collaboration. IC.IDO’s usability, physical calculation and real-time detection of parts colliding during the assembly process matched MAN’s needs. Not to mention, what previously took us two weeks can now be completed in just one day”.

--- Dipl.-Ing. (FH) Franz Obermair, Professor, University of Applied Sciences Upper Austria

Renault Runs a Crash Optimization Study on a 20 Million Elements Car Model with ESI Virtual Performance Solution

“This project was a success essentially due to the close collaboration between Renault and ESI. It brought to light the outputs and benefits linked to large size models for crashes. We were able to handle the challenges tied to the model’s creation and its use within an intensive context, such as optimization.”

--- Marc Pariente, Numerical Simulation Trade Specialist, Renault SAS

Comil Ônibus Reduces Distortion by 75% Using ESI Weld Planner

“Simulating the steel welding sequence using Weld Planner software significantly reduced manufacturing cost and time. The simulation results allowed us to control the dimensions of critical parts and avoid rework in our assembly line.”

--- André Luis Petry, Engineering Supervisor, Comil

ESI-Xplorer Enables Engineers to Manage Increasingly Complex Systems Early in the Product Development Lifecycle

“Managing the complexity inherent to advanced systems modeling requires mastering the architecture of the model, the multi-domain dynamic behavior, and the link between model, simulation and system engineering. This is why system simulation software is becoming a necessity.”

--- Dr. Emmanuel Arnoux, Expert in Systems Simulation, ADAS & Autonomous Driving Department, Renault SAS
Dedicated Solutions for Aerospace & Defense

ESI's Virtual Prototyping solutions enable manufacturers and their suppliers to accurately model parts, systems, and components from the early design stages.

ESI Contributes to the Project “Passenger Seats of the Future” Led by Zodiac Seats France

Led jointly with Zodiac Seats France, the project involves French industrial, academic and institutional partners, and has as its objective the identification of innovative solutions that meet the expectations of both airlines and passengers for aircraft seats. ESI’s Virtual Seat Solution delivers predictive capabilities in Virtual Prototyping and seat comfort prediction from the design to the pre-certification of the aircraft seats.

Shenyang Aircraft Cuts Fighter Jet Structure Parts’ Weight Using ESI PAM-STAMP

“With both superplastic forming and diffusion bonding simulation using PAM-STAMP, SAC cut by half its average tooling development time of the complicated structure parts and made the fighter lighter.”

—— Yuan Li, General Manager, Shenyang Aircraft Corporation

Aerostructures Manufacturer Aernnova, Uses ESI's Composites Simulation Suite to Design and Optimize its Manufacturing Processes

“With ESI’s PAM-RTM, we now have a tool and a methodology to predict and correct all possible defects occurring during the injection process; starting at the beginning of the design of the mold, before any physical trial.”

—— Federico Martin de la Escalera, Head of Research and Technology Department, Aernnova Engineering Solutions Iberica

EADS CASA ESPACIO Successfully Implements ESI VA One for Vibro-Acoustic Analysis of Spacecraft

“VA One meets our needs for the vibro-acoustic analysis of spacecraft across the entire frequency range. With a single tool we can account for all the vibro-acoustic loads on our satellites.”

—— José Luis Riobóo, Responsible for Engineering Organization, EADS CASA ESPACIO
Driving Innovation Across Industry Sectors

Supporting you with Virtual Prototyping software and global teams of expert engineers, ESI delivers the right solution for your engineering challenges. Bring your most innovative projects to life!

Civil Engineering

SL RASCH Collaborates With ESI to Achieve Architectural Excellence in Mecca and Medina

“With the know-how of ESI experts and the capabilities built into ESI’s advanced CAE software solutions, designing our innovative structural systems became possible.”

— Dr. Mahmoud Bodo Rasch, Founder and Owner, SL RASCH GmbH

Energy and Power

Inasmet-Tecnalia Standardizes the Quality of Large-Size Castings with ESI ProCAST

“ProCAST recent developments prove to be excellent for predicting the microstructure and the basic mechanical properties of casting materials. The microstructure module opens a new line of possibilities and makes other types of analysis possible, particularly related to the adjustment of the metallurgical quality level using the inoculation parameters in simulation.”

— Dr. Antton Meléndez Arranz, Metallurgist, Inasmet – Tecnalia

Biomedical

INEGI Manufactures Customized Hip Prostheses in a Cost Effective Way

“Scientific methods can always save us time and cost. ProCAST is just that tool helping foundry men find the right solutions. For investment casting process, ProCAST can generate different layers of shells and with wrapping outside. This helps predict the temperature field more precisely.”

— Nannan Song, Senior Researcher Advanced Foundry and Rapid Prototyping Technologies, Inegi

Electronics & Consumer Goods

SAMSUNG Electronics Benefits from a Virtual Prototyping Platform, Saving Up to 90% in Engineering Time

“Using guided CAE automation early in the design process enables us to identify the right concepts and verify design changes in order to save time and cost.”

— Jeong-Rho Lee, Senior Engineer, SAMSUNG Electronics Corporation
ESI provides engineering services and support to its international industrial customer base. With subsidiaries, agents and distributors established in more than 40 countries, ESI Group employs about 1100 professionals worldwide.