

# ENTERPRISE RESOURCE SIMULATOR

A GAME CHANGER IN THE MARKET OF SIMULATION



# A game changer in the market of Simulation: Enterprise Resource Simulator

The advent of Industry 4.0 has introduced an era of digital transformation, where data has become a key value driver for all businesses. With the interconnection of all relevant production and support processes, optimization efforts are no longer limited to single factories but encompass the entire supply chain. Smart logistics and smart warehousing are becoming the norm with the rapid advancements in technology and digitalization. As we move towards Industry 5.0, the optimization focus will not be limited to increasing efficiency and productivity but also to improving sustainability and the well-being of employees.

It is essential for companies implementing Industry 5.0 to have a powerful simulation platform that can simulate entire production plants, distribution centers, or supply chains accurately and in detail. InControl Enterprise Dynamics is developing the next-generation simulation platform, Enterprise Resource Simulator (ERS) to embrace this challenge. The ERS platform provides companies with an integrated and efficient set of tools to make applications that can be used to simulate on any scale or scope. Because ERS is a platform, companies can develop their proprietary applications in-house while still using the efficiency and quality produced by a trusted, dedicated simulation company like InControl Enterprise Dynamics.

With the vast increase in data availability and computer power as the industry moves to industry 5.0, mass simulation is becoming more relevant than ever. ERS aims to fully utilize the newly available resources to find the explanations for the observations that big data can find. It enables the development of models to optimize decision-making, design, implementation, and operations of complex infrastructures. In addition, simulation software can support organizations to evaluate risks, costs, implementation barriers, and impact on operational performance.

The ERS platform enables the industry to build applications that can effectively process large amounts of data to use in simulations. ERS can calculate the results of these simulations in parallel for excellent speed and responsiveness. The ERS platform does this by allowing simulation in parallel both between models and within one model. ERS cannot only simulate one process but virtually every

process because it allows for intuitive simulation in any formalism. Combined with the speed and scalability of ERS, this allows for more complex and realistic models that can answer the questions of the industry. This allows ERS to fully utilize the provided hardware, providing more speed with the same hardware.

In conclusion, simulation software is a crucial technology that drives the optimization of complex infrastructures in Industry 4.0 and Industry 5.0. The vast increase in data availability has made simulation an essential tool for optimized decision-making, design and operation within complex infrastructures. With the development of powerful simulation platforms like ERS, companies can simulate the entire supply chain in detail and achieve their business goals more effectively.

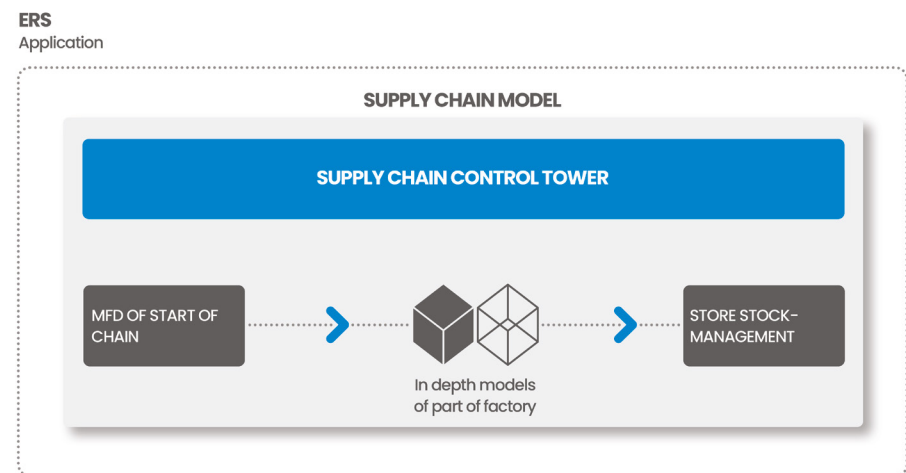


Figure 1: ERS Scalability

# Business Values

The ERS platform offers a range of business values to customers, enabling them to optimize their operations, reduce costs, improve efficiency, and increase sustainability. With the ability to simulate the entire supply chain in detail, customers can make better-informed decisions and achieve their business goals more effectively.

1. Strengthen decision-making: ERS enables the development of simulation applications that can help to evaluate and optimize decision-making across the entire supply chain. ERS can help with decisions in fields as diverse as APS, personnel planning, determining the flexibility of product series, and safety procedures. Due to the speed, scalability, and multi-formalistic nature of the ERS platform, these can even be combined in one simulation!

2. Enhanced design and implementation: With ERS companies can build a simulation application that can simulate the behavior of a plant before it has even been built. This can then be integrated with a simulation of the entire supply chain, allowing the evaluation of not just the behavior of the proposed design within a local context, but even within the context of the whole supply chain.

This enables companies to design and implement more effective production facilities, with optimized production lines that reduce waste, and increase output.

3. Increased operational efficiency: ERS supports the creation of simulation applications that can be used in real-time, so that even within the operation the effect of decisions can be evaluated before they are executed, leading to better and more predictable decisions. This can help supply chain control towers manage the complex reality of disturbances and unexpected decision moments.

4. Improved risk management: The ERS platform can be used to build applications that evaluate the risks most relevant for the supply chain and the broader business around it. Risk management is, in general, a strong point of simulation, and with the new speed and scalability, it becomes possible to evaluate more and more complex risks.

5. Improved sustainability: By providing better insights into the entire supply chain, ERS supports organizations to increase their sustainability by reducing waste and energy consumption and increasing the efficient use of raw materials.

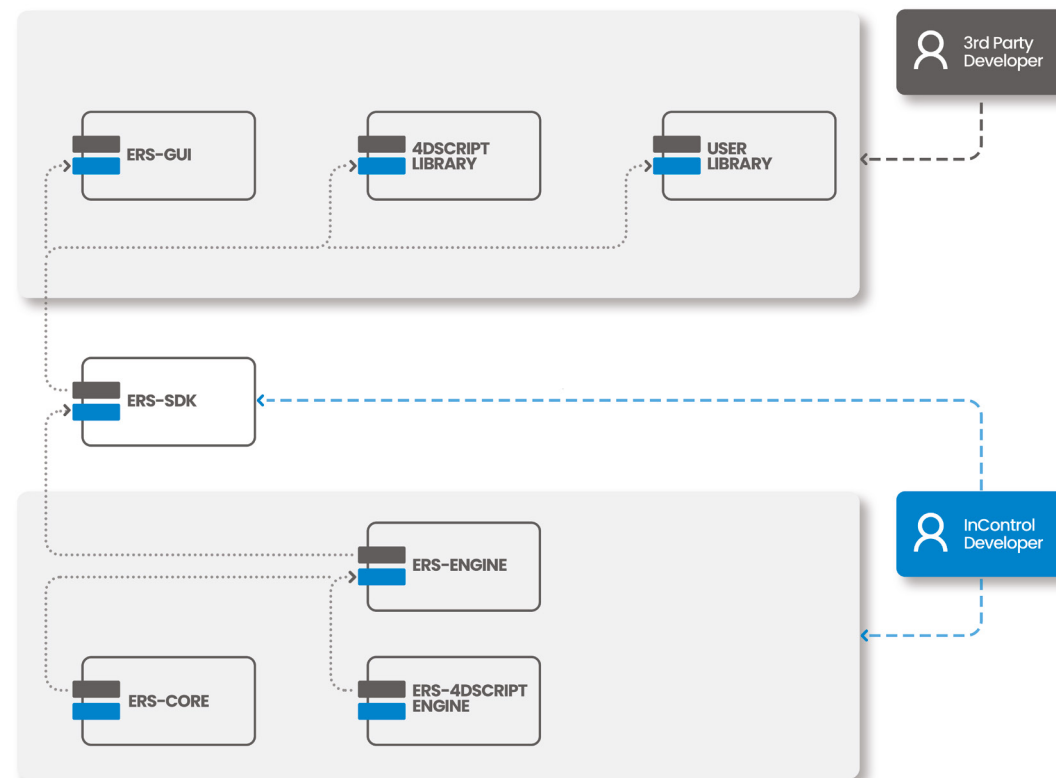


Figure 2: ERS Development Toolbox

# Technical Features

## › Multi-formalism

Within ERS, it is possible to build simulation applications with multiple formalism within the same model. This means that multiple processes can all be intuitively modeled within one connected logic.

## › Cross-platform

ERS is designed in such a way that we can support virtually every common platform. This allows for deployment on different operating systems.

## › Real-time interaction

Parameters can automatically and manually be updated during a simulation run.

## › Intensive multi-threading

Multi-threading allows for parallel calculations. Parallel processing allows for huge performance increases.

## › Scalable Applications

ERS supports a scalable application structure that allows the creation of very large models. This is achieved with the latest techniques in data storage as well as distributed simulation.

## › Variable, conceptual modelling scale

ERS is built to work on any conceptual scale, whether that is on the millimeter scale or on the global supply chain scale.

## › Development in general languages

ERS does not just support development in its own proprietary language, but also general programming languages such as C++. This means intermediate development can be done in the language that is used for other systems as well. It also means the code that is used outside of the simulation to control the simulated system, can be used within the simulation.

## › Extendible

ERS allows extensions of functionality, giving intermediate developers the flexibility to include the functionality they need. This allows for the integration of specific optimization algorithms as well as AI and machine learning.

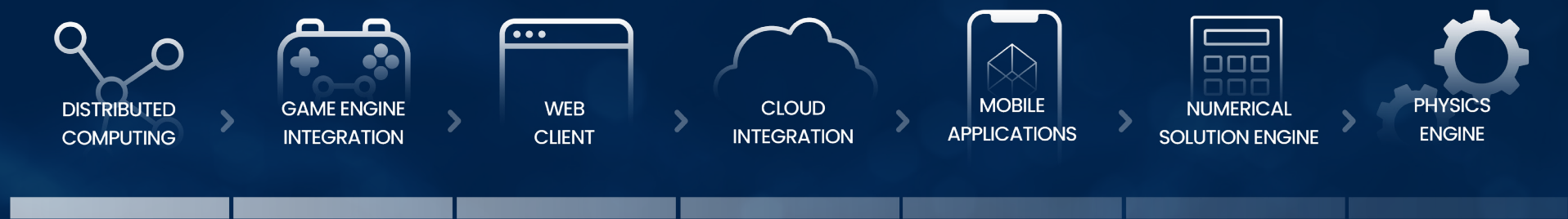
## › Interaction with a broad range of protocols and standards

ERS supports connection between itself and other applications through several protocols, such as TCP/IP, UDP, HTTP 3 and GRPC, which are necessary for emulation models and ERP (like SAP) interactions. These can also be used to connect ERS with big data applications. Not only does ERS support many types of connections, due to the extendible nature of ERS intermediate developers can add even more possibilities.



# Roadmap

Future expansions of the ERS platform.



**Stay informed about the latest features and releases of the ERS Simulation Platform.**

**Sign up for our newsletter today!**







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