

# BREI AT A GLANCE

## Simulation



Simulation as an Industry 4.0 enabling technology refers to software used to virtually test out potential improvements in processes, products, systems and concepts. Many manufacturers are utilizing CAD-based simulation modeling in design and testing. Additionally, some manufacturers have taken simulation a step further by using “digital twins.” A digital twin is a virtual model of a real object. Real time data can be used to simulate the impact of any proposed changes without impacting the real object. As more and more equipment is sensorized, more impacts to objects can be measured and simulated on virtual models. This technology has the potential to benefit multiple industries. You can help your businesses learn how simulation may help improve their bottom line by sharing some of the following information with them.

### Webinars, Videos or Podcasts to Share



- Technically Iowa Podcast, [Simulation & Manufacturing with Altair](#)
- [3D Manufacturing Simulation 101 | How Does 3D Manufacturing Simulation Work?](#)

### CIRAS Webinars on Demand:

- [Simulation – Plant Layout Tools](#)
- **CIRAS Industry Technology Video**
- [Simulation](#)

### Cut & Paste Text for Your Next Newsletter



#### Simulation Could Improve Your Production & Performance

Iowa manufacturers are embracing the virtual world simulation to boost their bottom-lines. Simulation programs allow manufacturers to create and experiment with virtual representations of parts, facility layouts or processes. The programs are used to test, troubleshoot and validate parts, products, systems and new ideas without physically moving heavy equipment and machinery around or incurring many of the expenses associated with prototyping and failure testing. Do you have an area of production, assembly, inventory or logistics that need improving? Simulation may be worth considering!

Simulation can assist in many common aspects of manufacturing including:

- ✓ Designing and balancing of assembly lines
- ✓ Throughput and capacity planning
- ✓ Process improvement and bottleneck analysis
- ✓ Inventory management
- ✓ Facility layout and resource allocation
- ✓ Clarity of work instructions and revision management
- ✓ Programming robotics and automation equipment
- ✓ Improving build quality and validating alternative raw materials
- ✓ Parts or tooling design and testing

Check out this blog post from NIST: [Simulation is a Window Into the Future of Your Manufacturing Operation.](#)

## BREI Discussion Starters for Your Visits with Local Businesses



1. Are you doing any prototyping internally or for clients? If so, are you using any type of simulation software?
2. How do you decide where new machinery fits best into your process?
3. What kinds of bottlenecks are you encountering? How do you go about solving your sticking points (physical changes or simulation of changes?)
4. Have you used simulation in any form for part development, process improvements, floor layout, etc.?

## Simulation Referrals to Share

### Public sector service providers for your businesses:

- [CIRAS](#) offers assessments and assistance with cost benefit analysis, process improvements and integration planning, among other services. [Click here to see how CIRAS helped MalvenWorks using simulation services.](#)

### Simulation Software Vendors:

- [Altair](#)
- [Simul8](#)
- [Simio](#)
- [Siemens](#)
- [AnyLogic](#)

Disclaimer: This is not meant to be a comprehensive list of service providers

## Additional Resources and Reading for You or Your Businesses



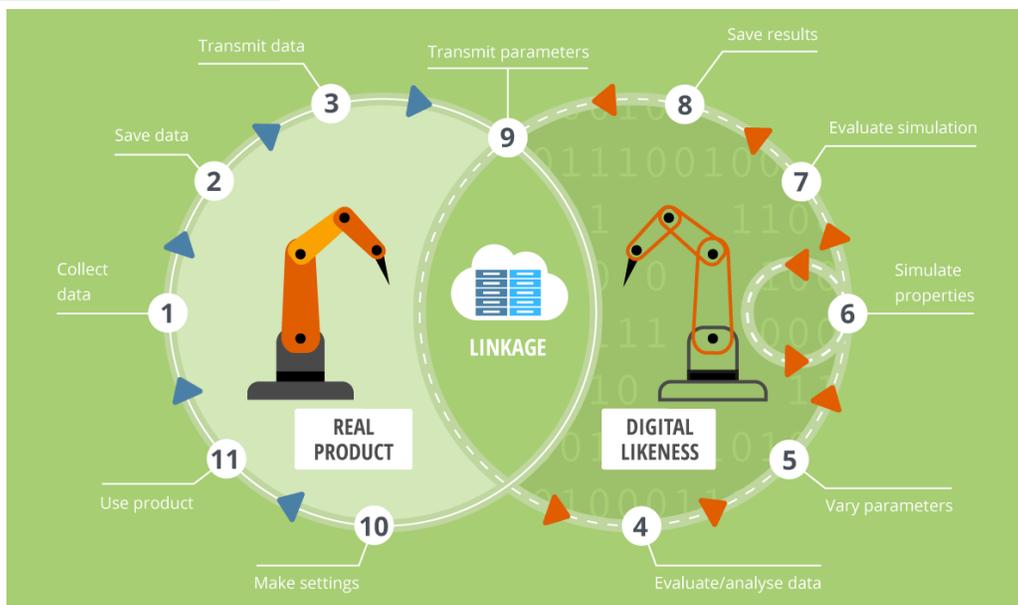
- ✓ [Simulation in Manufacturing: Review and Challenges](#), an article in *ScienceDirect*
- ✓ [Process Simulation and its Benefits](#), an online article on CRB Group's website. The site includes [multiple simulation articles](#) on its "Insights" tab.
- ✓ [Five Considerations before starting your next simulation project](#), an article from Flex.

"Any organization can purchase and implement software, but the value comes when you derive information that enables your team to make the right, impactful business decisions."

## Recap: A Simulation Model or Digital Twin?

A simulation model depicts a process or activity based on operational data and tests (simulated) based on previously collected data. A digital twin is a model that depicts a real object and then uses real time data to simulate the impact of any proposed changes. Which is appropriate comes down to the data you need to build and test your models, decision-making (existing or real-time), the data you are able to collect (networked or not networked), and the resources you have available (technology know-how and funding).

### Cycle of Improvement:



BREI at a Glance is Produced through a Partnership of:

The University of Northern Iowa EDA University Center - Institute for Decision Making

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