

## A Look at Simulation and Prototyping Practices Across the Globe

Engineering.com audience survey of simulation vs. prototyping



This research has been sponsored by Dassault Systèmes.

# Virtual Simulation Practices

### WHAT MAKES SIMULATION WORK CHALLENGING?

Running simulations is not an effortless endeavor. Almost half (49%) of respondents struggle with the amount of time and effort required to set up the model in the pre-processing phase. Some (24%) found it hard to maintain adequate resources for advanced simulations.

Other challenges were the time required to run the simulation (11%), and not having the right tools (10%).



#### Q: What is the most challenging aspect of simulation work?



#### Innova can help!

Virtual testing can seem like a minefield when you're just getting started, but it needn't be that way! With SOLIDWORKS Simulation you're getting easy-to-use, industry proven technology, backed up by our award winning support team who are there when you need them. Try out our support team for yourself with a free trial today.

N = 246

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### WHAT KEEPS ENGINEERS FROM RUNNING SIMULATIONS MORE FREQUENTLY?

Respondents identified three main barriers preventing engineers from running simulations more often: a lack of knowledge (47%), the expense (41%) and a lack of trust in the results (37%). Lack of time (9%) was another barrier.

These factors will need to be overcome if we are to see higher simulation rates in the future.



Q: What keeps you from running simulations more often? Select all that apply.

N = 176



#### Innova can help!

With over 1,500 customers and almost 20 years in the business, our team have the real-world knowledge that you need - whatever the size of your company. We'll make sure that you select the best software for your needs and our official training courses will ensure that your team are making the most out of your investment.

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### WHEN WORKING WITH SIMULATIONS, DO SMALLER ENGINEERING FIRMS HAVE AN ADVANTAGE OR DISADVANTAGE?

Pre-processing appears to be the greatest challenge for most engineering companies, but this problem is pronounced for mid-size companies with 21 to 100 engineers (65%). Interestingly, these companies seem to be at an advantage in maintaining resources for advanced simulation—14% consider this a big challenge compared to around a guarter for all other companies.



Less than 5 engineers (n=88) 6 to 20 engineers (n=65)

21 to 100 engineers (n=37) More than 100 engineers (n=53)

- Pre-processing: Effort/time to setup model
- Solve time: Job duration
- Having and keeping resources to run advanced simulation
- No optimisation tools to drive design by simulation
- Other

Qs: What is the size of your engineering office? What is the most challenging aspect of simulation work?



#### Innova can help!

Our Simulation tools are just as intuitive and easy-to-use as SOLIDWORKS 3D CAD. Running inside the same window, it's as simple as switching to a new tab where the wizard-based interface guides you through the relevant steps. If you do need any help, all you need to do is pick up the phone and our simulation specialists will walk you through it step by step.

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### HOW DO ENGINEERS FEEL ABOUT THE IDEAL VS. ACTUAL NUMBER OF ITERATIONS REQUIRED PRIOR TO PRODUCTION?

We asked survey takers to estimate how many design-virtual simulation iterations they complete before producing the first part or prototype. On average, respondents indicated that they go through 19 iterations of the cycle before producing the first part or prototype.



Q: On average, how many iterations through the design-virtual simulation cycle do you use before producing the first part or prototype?

N = 224



#### Innova can help!

With SOLIDWORKS Simulation, you only need to run the set up once and the software does the rest, executing the same study across multiple iterations, saving you time and effort. Ask us for a bespoke demo using your existing product designs. We think you'll be impressed when you see how easy it is!

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### HOW DO ENGINEERS FEEL ABOUT THE IDEAL VS. ACTUAL NUMBER OF ITERATIONS REQUIRED PRIOR TO PRODUCTION?

The majority (69%) are happy or okay with the current number of iterations, but some (12%) are not.



Q: Are you satisfied with the average number of iterations of the simulation cycle in your organisation?

If not, what is your target number of iterations? [open text]

#### Innova can help!

Topology optimisation in SOLIDWORKS Simulation can generate designs based on weight, strength, factor of safety and more. This limits the amount of iterations you need to create, because the software automatically converges on the perfect design for you. Get in touch with us to find out more.



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N = 248

N = 21

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## HOW DO ENGINEERS COMBINE SIMULATION WITH PHYSICAL TESTING?

At the 0 – 4 iteration range, engineers created an average of eight physical prototypes prior to finalising the product's design.

At 5 – 9 iterations, the average number of prototypes dropped down to three.

Those who run 10 or more iterations are also averaging 18 prototypes.



Average Number of Prototypes

Q: How many physical prototypes do you typically create before finalising the product design? [open text]

On average, how many iterations through the design-virtual simulation cycle do you use before producing the first part or prototype? [open text]



#### Innova can help!

Finding your ideal number of iterations is a balancing act between trial and error and meeting your project deadlines. Why not remove the guesswork? Speak to our Simulation experts and they will work with you to assess your current process to create an effective training schedule and workflow based on your desired outcomes.

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### WHAT WOULD ENGINEERS CHANGE TO STREAMLINE DESIGN-SIMULATION CYCLES?

Our survey respondents recognised that the design-simulation cycle could be better. The majority (51%) would enable designers to run analytics themselves much earlier in the design phase; they saw this as a strategy to lower the number of cycles.

Some (24%) would use best practices to encourage more collaboration between designers and analysts. A small group (12%) would use a consistent model for analysts and designers.



Q: What can you do to better streamline design - simulation cycles?

N = 246



#### Innova can help!

SOLIDWORKS Simulation runs concurrently with SOLIDWORKS 3D CAD, enabling you to start testing earlier in - and as part of - your design process. You're free to experiment, too, safe in the knowledge that you've got the back up of our multi award-winning technical support team.

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## HOW LONG DOES IT TAKE TO OUTSOURCE SIMULATION WORK?

While outsourcing can free up engineers' time and provide a much-needed third-party perspective, don't expect a quick turnaround. Feedback from those who outsourced indicated that for 43%, it could take at least a week, if not multiple weeks (30%) or even a month (15%) to receive the results.

Only 13% of third-party analysts turned around results within a few days.



Q: If you are outsourcing your simulation projects, how long does it take to obtain the results you need?

N = 47

#### Innova can help!

Are you ready to bring Simulation in-house? With over 1,500 customers and almost 20 years in the business, Innova Systems have the real-world experience that you need. Get in touch with us today for expert advice, up-to-date pricing and to organise your free trial and demonstration.

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