SimDesigner Enterprise
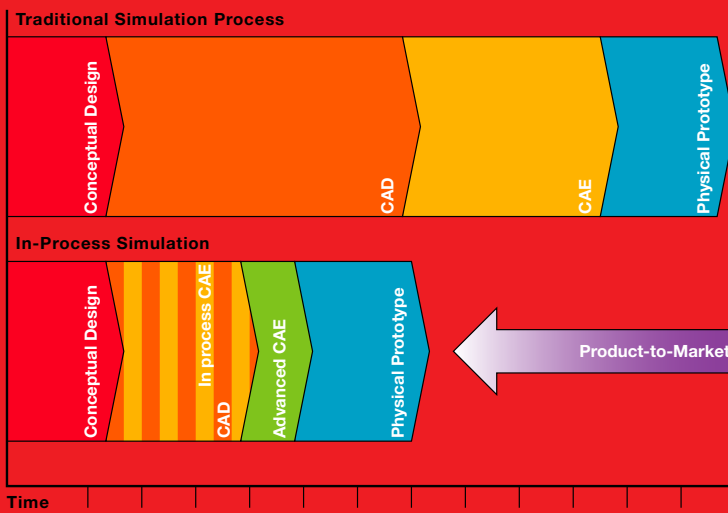## Gain a Competitive Edge
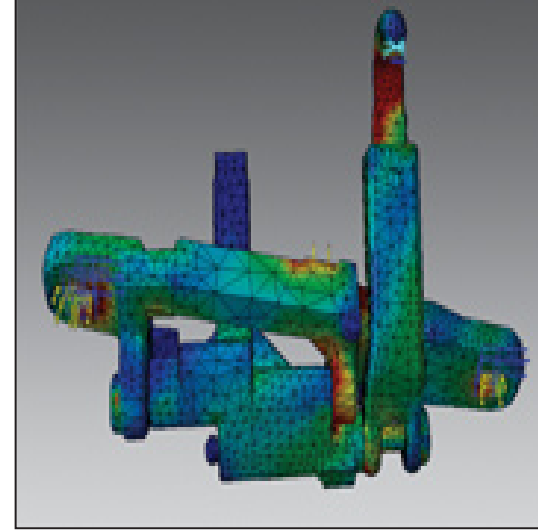## with In-Process Simulation

MSC Software

Companies the world over are faced with daunting product development challenges. That's why many of today's top manufacturers and suppliers are working with MSC.Software, the leading global provider of virtual product development tools that transform the product development process.

MSC.Software's enterprise solutions use detailed digital product models to simulate and verify every aspect of product performance, make and track critical design decisions, communicate and coordinate product development activities, and accelerate product innovation beyond the competition.

The company's fully realized portfolio of solutions includes SimOffice Enterprise, SimDesigner Enterprise, and SimManager Enterprise – turnkey products designed to enable companies to more rapidly deliver superior products to market.

Traditional Simulation Process

Conceptual Design

CAD

CAE

Physical Prototype

In-Process Simulation

Conceptual Design

In process CAE

CAD

Advanced CAE

Physical Prototype

Product-to-Market

Time

Enterprise Product Development Challenges

Breakthrough Design Benefits With Upfront Analysis
Manufacturers today face intense global competition, demanding customers, increased product complexity, compressed product cycles, profit pressures, and many other issues. These challenges exert tremendous pressure on the product design lifecycle – leaving companies searching for ways to speed design, reduce costs, and improve quality and innovation all at the same time.

Traditional design processes hinder the ability for companies to make significant design process improvements. Often, products are designed and then "thrown over the wall" to expert analysts for testing. However, once the analyses are done, it's too late in the game for innovation and quality improvement. Finding flaws at this point make design iterations difficult and expensive.

What if you could eliminate the barrier between designers and analysts and bring valuable simulation analysis into the design process when it can really make a difference? That's what savvy manufacturers are starting to do, with dramatic results: better, earlier decision-making, reduced time-to-market, reduced costs, better quality, and faster, more competitive innovation.

SimDesigner Enterprise – Enabling True Simulation-Driven Design
Introducing MSC.Software's CAD-embedded simulation suite with enterprise collaboration and centralized data management. SimDesigner Enterprise provides an intuitive, CAD-integrated way for design engineers and engineering teams to perform repeatable, fully-documented simulation studies earlier in the design process. Product teams across the extended enterprise can now create and collaborate on product designs and performance simulations in one powerful application.

- **Speeds Time-to-Market and Innovation -** SimDesigner Enterprise is fully integrated within the CAD process, empowering users to conduct in-process simulation and explore design alternatives earlier – enabling leading-edge innovative designs and rapidly accelerating design cycles.

- **Reduces Development Costs -** Design engineers gain valuable insight into product performance characteristics and can perform additional design comparisons earlier in development cycles. A series of virtual prototypes can even be investigated during early stages of the design process, reducing physical test costs.

- **Improves Product Quality -** SimDesigner Enterprise empowers more real-life, early simulation studies – reducing design flaws, warranty costs, and field failures.

- **Enables Better Collaboration -** SimDesigner Enterprise provides model reuse and data interoperability between design and analysis. CAE specialists can focus their time on larger, more complicated analyses while design engineers conduct upfront simulation studies to improve designs.

- **Improves Productivity and Consistency -** SimDesigner Enterprise handles and collaboratively stores the simulation pedigree generated from repeated analysis runs. No more wasted time searching for or recreating simulation inputs and data.

Customer Success
ASC Incorporated
(American Specialty Cars)

Business
Leading automotive supplier of convertible systems and specialty vehicles

Challenge
Reduce time and costs by moving towards a Design-Analyze-Confirm mode and away from Design-Build-Test

Solution
MSC.Software SimDesigner analysis studies used for repeatable CAE tasks

Value
Failure points in the handle for a convertible top latch mechanism were identified and addressed. Plus, the first stage of physical prototyping and testing was replaced.

"By determining the weak areas in the initial design early on in the process, a substantial amount of time and money was saved."

Stephen Doncov
ASC Incorporated

Learn more at **simdesigner.mscsoftware.com**

Enterprise Solutions

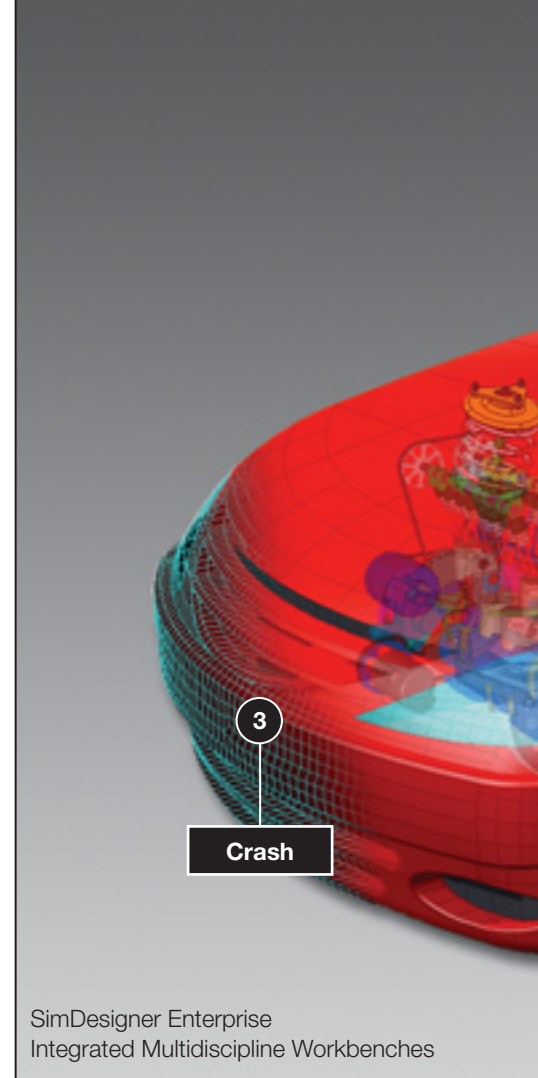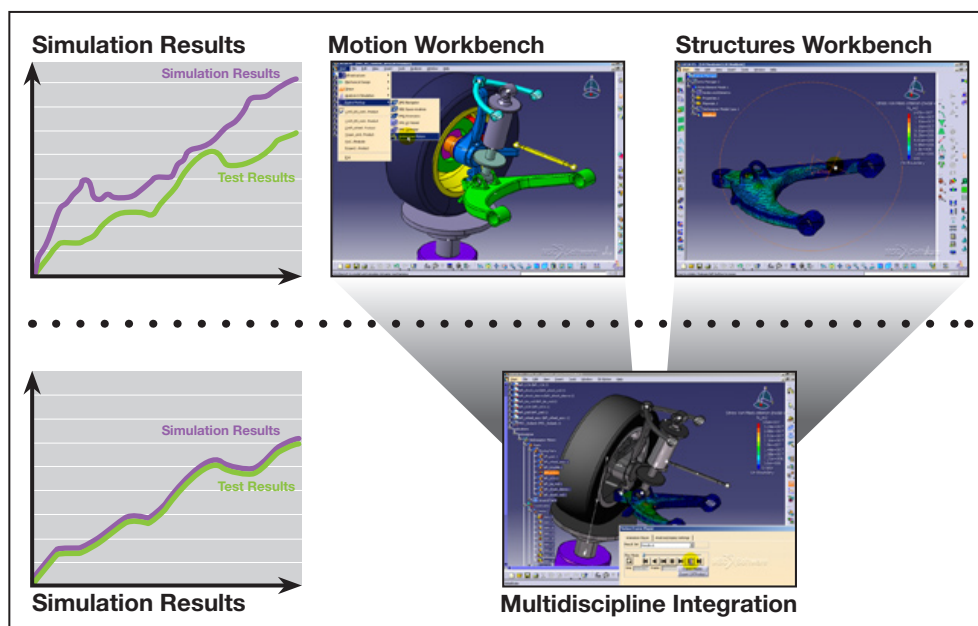**Designer-Friendly Early Validation Tools in One Powerful Package**
SimDesigner Enterprise gives design engineers scaleable, easy-to-learn simulation tools within the CAD environment that increase first pass simulations, empower more what-if scenarios, and identify design flaws earlier. This feature-rich suite of tools includes multidiscipline simulation workbenches, with built-in data management and collaboration capabilities for managing, controlling, and reusing simulation data.
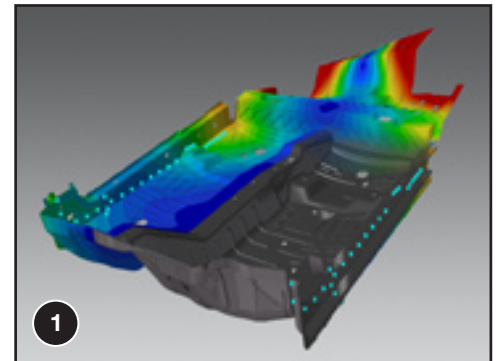
SimDesigner Enterprise includes:
• Integration with CATIA V5 mechanical CAD software
• Multidiscipline simulation workbenches
  - Structures workbench, both linear and nonlinear
  - Motion workbench
  - Thermal workbench
  - Crash workbench
• Enterprise Gateways to compute resources
• Data management and collaboration capability

Multidiscipline Workbenches Provide Powerful, Accurate Analysis
SimDesigner Enterprise offers integrated, easy-to-use workbenches to enable users to perform multidiscipline simulation studies at the sub-assembly and full system level without leaving the CAD environment. For example, design engineers can use the Motion workbench to investigate multi-body dynamics while assessing loads and forces in the assembly. The loads generated from motion analysis can subsequently be transferred and applied to a flexible body structural simulation for examining stresses during motion simulation. Engineers never have to leave the SimDesigner environment to perform these analyses – and no time-consuming data conversion is required. This up-front analysis leads to faster product performance decisions and helps identify design flaws earlier.
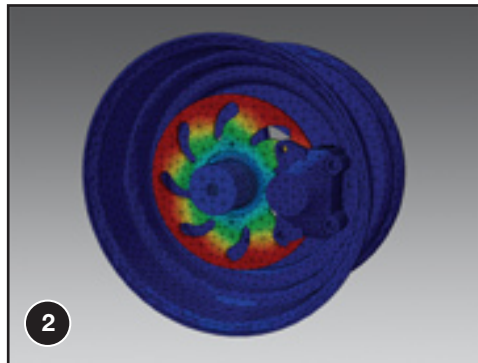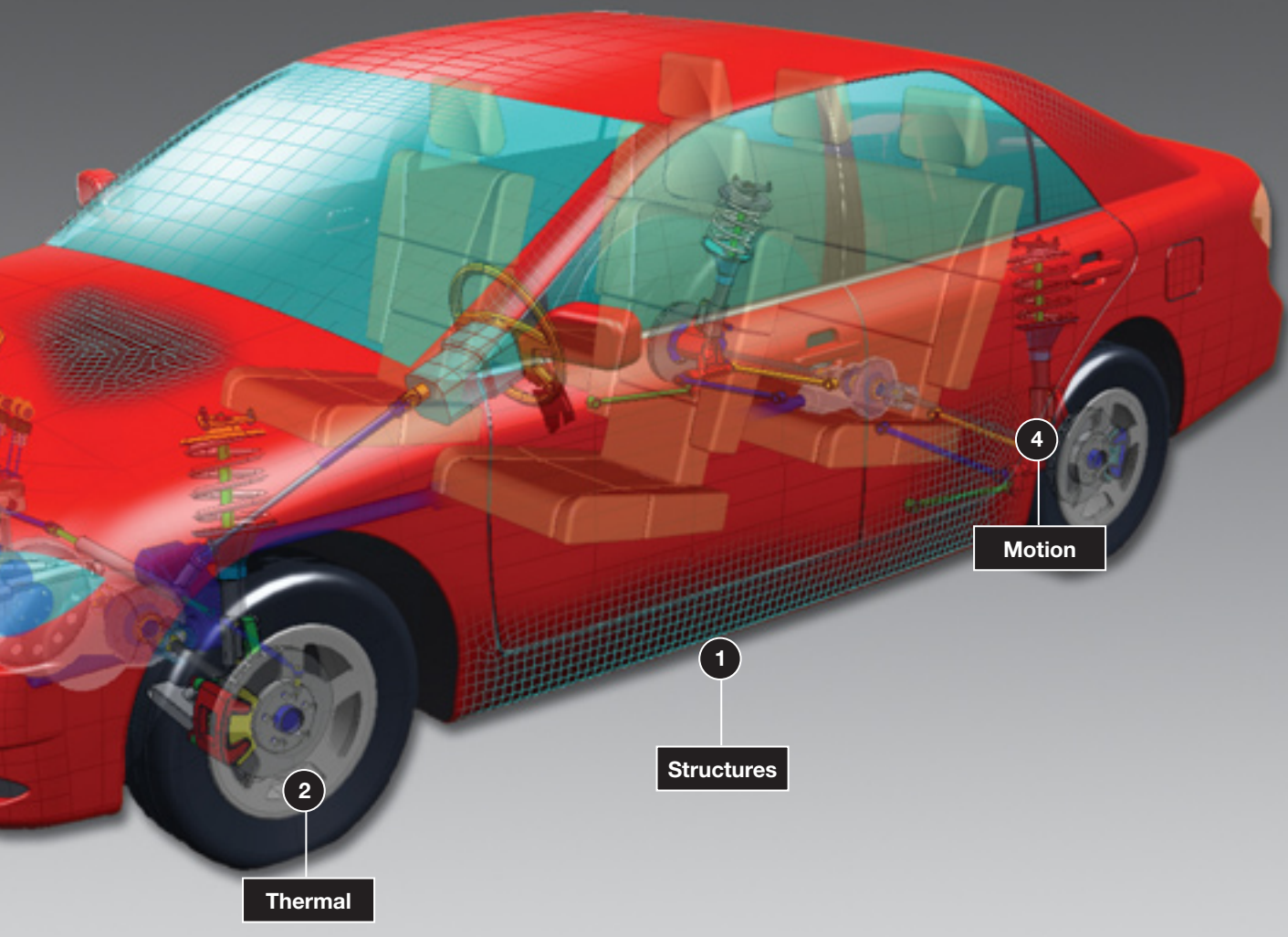

SimDesigner Enterprise
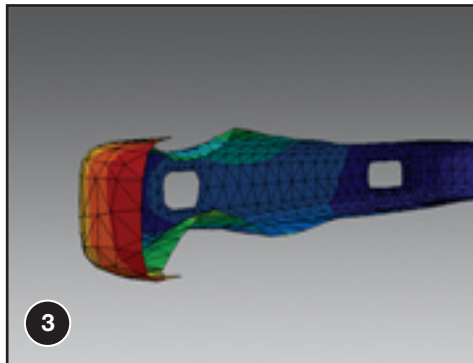Integrated Multidiscipline Workbenches

Structures Workbench
The SimDesigner Structures workbench is powered by MSC Nastran, the world's leading simulation and finite element analysis product. The intuitive SimDesigner Structures workbench enables design engineers to simulate how a design behaves under real-world conditions without having to solely rely on costly physical prototypes. The Structures workbench includes both linear and nonlinear generative analysis. Users can easily perform linear static, normal modes, and dynamic analysis, while nonlinear large deformation, contact, and material plasticity can be studied within one common interface.

Simulation Results

Simulation Results
Test Results

Motion Workbench

Structures Workbench

Simulation Results

Simulation Results
Test Results

Multidiscipline Integration

Motion

4

1

Structures

2

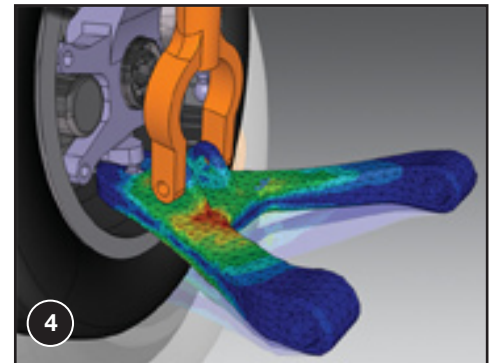**Thermal**

2

3

4

Thermal Workbench

The SimDesigner Thermal workbench enables users to easily and cost-effectively perform generative heat transfer studies. For instance, designers can use the Thermal workbench to determine the most thermally-effective or cost effective heat transfer path. Thermal workbench capabilities include steady-state or transient analysis, as well as thermal-mechanical coupling. The Thermal workbench is powered by Marc, the most comprehensive and advanced nonlinear finite element analysis (FEA) solution on the market.
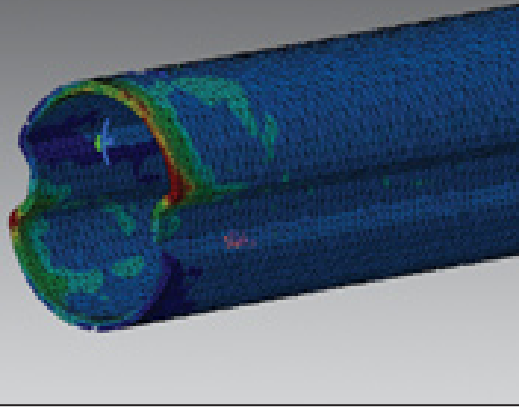
Crash Workbench

The SimDesigner Crash workbench enables design engineers to investigate highly nonlinear, time-dependent problems within the CATIA V5 environment. Using the Crash workbench, design engineers can perform drop test analysis, simulating the effects of impact and damage that occur in real-life situations. Virtual drop/crash tests reduce costs normally incurred with physical drop testing. With the SimDesigner Crash workbench, it's easy to set-up and run the analyses, plus the Crash Workbench offers an integrated gateway for LS-DYNA for more complex analyses and data-sharing with analysts.

Motion Workbench

The SimDesigner Motion workbench extends CATIA V5's Kinematics capability by enabling users to easily perform multi-body dynamics simulation on rigid and flexible bodies. Powered by Adams, the worldwide standard in multi-body motion simulation, the Motion workbench generates loads and forces that can subsequently be transferred and used for structural analysis studies. The Motion workbench helps designers analyze and optimize designs to meet performance objectives by better understanding the functional behavior of parts and products.

simdesigner.mscsoftware.com

Enterprise Collaboration

Customer Success
GARDENA

Business
GARDENA is the leading European producer of high-quality gardening tools

Challenge
To improve product performance and reduce development costs
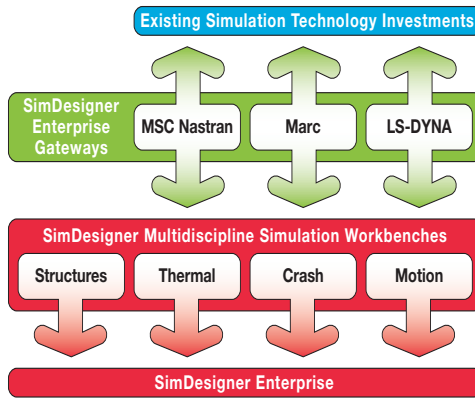
Solution
Using SimDesigner, GARDENA can reduce external calculations and perform more in-house simulations. It perfectly complements the existing CATIA environment

Value
Accelerates time-to-market and improves product performance

"By using SimDesigner, we will now be able to make design decisions earlier in the design process, which will help us to reduce development time and cost."
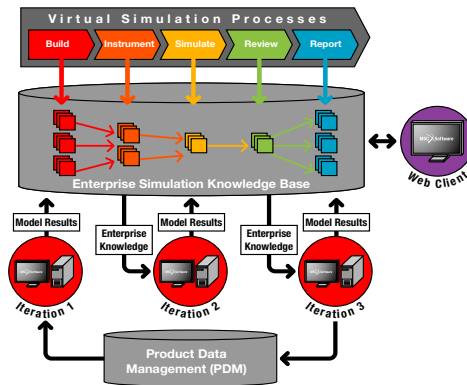
Peter Rudolf, Dipl. Ing.
Precision Engineering Division
GARDENA

Enterprise Gateways – Leverage Existing Simulation Investments
SimDesigner Enterprise Gateways enable users to leverage existing virtual product development investments by exporting run-ready solver input files to enterprise compute resources such as MSC Nastran, Marc, and LS-DYNA. This facilitates a higher level of collaboration and communication between design engineers and analysts across the enterprise. Analysts can pick up where design engineers leave off, without any data translation or need to recreate the same analyses.

Users may also submit a job and subsequently import and visualize the results within SimDesigner Enterprise. Enterprise Gateway capabilities include the scheduling and monitoring of jobs on remote queues using a built-in utility and an e-mail feature to send models, solver input decks, results, and other data to domain experts.

Process and Data Management – Ensuring Consistency Across the Enterprise
With SimDesigner Enterprise, users can capture and manage simulation data between users, workgroups, or even locations, enabling process automation across teams and the application of best practices. Within the SimDesigner interface or via the Web client, design engineers can seamlessly check-in/check-out simulation inputs, models, results, and materials data. This ensures consistent methods of performing simulations and managing work-in-progress data between design teams. It also enables organizations to instantly locate earlier versions of simulation data for reuse on new projects.

The SimDesigner Enterprise Web client provides remote access to simulation pedigree databases, results, and information via standard browsers. This enables managers, CAE specialists, suppliers, or others to access simulation data for design reviews, test correlation, and reviews/approvals. The Web client can also be used to create, manipulate, edit, view and control simulation data.

SimDesigner Enterprise is built on the SimManager platform to support simulation data capture and reuse, revision management, results viewing, and collaboration.

Learn more at **simdesigner.mscsoftware.com**

**SimDesigner Enterprise – Transforming
the Product Development Process**
MSC.Software's SimDesigner Enterprise brings simulation
earlier into design, speeding time-to-market, improving
product quality, and reducing development costs.
SimDesigner Enterprise empowers design engineers with
turnkey functionality that enables more simulation studies
throughout the design process and makes these studies
available to a wide variety of users for improved decision-
making, better collaboration, and enhanced communication.

Contact the enterprise simulation professionals at
MSC.Software. You'll discover the software and services
you need to accelerate innovative products to market
while maximizing the return on your investment.

Visit www.mscsoftware.com

About MSC.Software
MSC Software Corporation is the leading global
provider of enterprise simulation solutions and
the trusted partner of leading manufacturers
around the world for more than 40 years.

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