

Automotive Innovation *with Invention Machine Goldfire*

You're in one of the most competitive markets there is. To navigate around tight curves in the automotive industry, innovation today means shifting into high gear to quickly respond to government regulations, globally distributed operations, and complementary technologies to ensure vehicle performance and top line growth.

With Invention Machine Goldfire, a unique innovation software solution, you can quickly transform ideas into products and make innovation a repeatable and sustainable process, allowing you to quickly respond to the changing landscape.

Designed with engineers, scientists and researchers in mind, Goldfire automates more than a dozen critical innovation tasks spanning a product's lifecycle—from identifying a new market to developing a new product to improving existing products.

Fusing proven innovation tools and methods with precise access to corporate and external knowledge, Goldfire systematically guides users through every day innovation tasks to bring structure and uniformity to inventive problem-solving, concept discovery, and idea generation and validation.

Leading automotive manufacturers and suppliers—including Bentley, Cummins, Delphi, Eaton and MAHLE Powertrain—are using Goldfire to:

- Identify strategies to reduce costs and introduce competitive differentiation
- Reduce liability through predictive failure analysis
- Gain deeper understanding of functional models and opportunities
- Generate and validate ideas to improve design and processes
- Find technical innovation solutions to reduce environmental impact
 - Engine systems, i.e. hybrids, fuel cells
 - Weight reduction, i.e. light steels, aluminum, magnesium, plastics
 - Emission filters
- Identify and leverage enabling and complementary technologies
 - Power, materials, security, nanotechnology, software and computers, wireless.

“We need to move fast to seize new growth opportunities and make sure our customers benefit from our innovations at the earliest opportunity. Goldfire helps us quickly carry out research and development projects by giving us a development platform with rapid and intelligent access to our internal systems, databases, and worldwide patent literature.”

*- Hugh Blaxill
Chief Engineer
MAHLE Powertrain, Ltd.*



SNAPSHOT OF PAST AUTOMOTIVE PROJECTS WITH INVENTION MACHINE GOLDFIRE

- Improvement of the insulation for battery pack cell seals.
- Explore methods to convert nitrous oxide in a lean tailpipe exhaust and simultaneously control HC/CO/NOx levels to meet emission standards.
- Discover new ways to effectively cool the shape memory alloy of a port fuel injector.
- Identify potential gaps in the market and support rapid development of a new valvetrain and deactivation system leading to two patents.
- Navigate around a blocking patent related to turbocharging capability for downsized engines - a key technology for the sustainable reduction of fuel consumption and carbon emissions.
- Research possible ways to increase effectiveness of a lead acid battery.
- Refine the rotor design of a synchronous reluctance machine to increase rotor speed but avoid deformation from centrifugal force.
- Reconfigure and improve the design of a smart battery to optimize its reset logic.
- Fix an urgent engineering problem - saving \$800K while reducing unnecessary analysis by 75 percent.
- Resolve a previously unsolvable problem in a failing automotive component - eliminating the failure, reducing annual production costs by \$350K and resulting in a new patent. Previous company ideas required increased cost and radical changes.
- Discover alternative design strategy to overcome scuffing of gasoline engine cylinder bores due to failure of spray bore during cold start testing conditions below -20 degrees F.

In the global automotive industry, challenges, opportunities and risks are everywhere - cost reductions, fuel economy, new technologies, safety and emissions regulations to name a few. To compete, automotive companies and suppliers need to balance cost containment and innovation to bring high-performing, differentiated products to market.

Explore how Invention Machine Goldfire can transform your innovation processes to drive optimum innovation results for your organization.

A major global automotive parts supplier used Invention Machine's innovation software to simplify and improve its fuel supply system – the resulting system was lighter, smaller, vastly simplified, and represented a cost savings of greater than 50 percent.



www.acuityinc.com ■ info@acuityinc.com

Main Office: 7320 SW Hunziker Street, Suite 205 Tigard, OR 97223
Toll-free: 888.747.0850 ■ Direct: 503.747.0850 ■ Fax: 503.747.4269

Global 2000 manufacturers in more than 25 countries rely on Invention Machine Goldfire for product innovation, process improvement and market expansion. For additional information, please visit InventionMachine.com.