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6 of 10
Jenkins: Toyota and the Curse of Software



7 of 10
Ian Bremmer and Nouriel Roubini: Solve...



8 of 10
George Gilder: Why Antagonize China?

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OPINION: BUSINESS WORLD | FEBRUARY 4, 2010, 7:09 P.M. ET

Toyota and the Curse of Software

By HOLMAN W. JENKINS, JR.



Other car makers are likely to face similar troubles.

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Data would be nice, but there isn't much to rescue us from endless, bottomless speculation. How many complaints of unintended acceleration received by Toyota credibly suggest a defect is to blame rather than driver error? Toyota doesn't say and probably doesn't know.

How many can be laid to the floor mats that Toyota initially blamed, how many to the sticky pedals that are lately cited as an additional culprit? We're betting some but not most, though no information has been made available.

Of those incidents that remain, must we assume an electronic glitch as the default explanation even if it can't be proved? Perhaps inevitably, which is a problem for the whole industry. One thing is sure: The price of a new car, already rising sharply because of technology, will surge as the cost of testing and retesting vehicle electronics now skyrockets.

Complaints of sudden unintended acceleration afflict all car makers and, as Toyota advised Congress recently, the cause is "very, very hard to identify." This reality, forensically and politically, is coming into collision with the growing reliance on computers and software in the vehicles we drive, which can now account for 40% of the value of a new car. And, yes, "feature wars" play a role, but we're here to tell you the biggest reason is government regulation requiring cleaner emissions.

A decade ago, what were single-purpose computers, each with its own software, began to merge into systems with many millions of lines of code. This allows for easier fault diagnosis. It allows any repair shop to update your software. One of these days, it will make it possible for the entire system to be monitored and updated over the Internet.

But implementing so many vital and not-so-vital control features as a network system also creates complexity and multiplies the opportunity for unpredictable software bugs and circuitry mishaps.

Take Toyota's latest troubles with its marquee car, the Prius. Even amid its runaway-acceleration traumas, the company was hit this week with Japanese and U.S. government investigations of brake failures in the 2010 version of its iconic hybrid.

A bit of history: Brakes were first introduced to computers and software for the relatively simple purpose of anti-lock braking. Then came stability control, giving brakes an additional computer-and-software controlled duty to perform.

In the Prius, brakes have now acquired a third function, "regenerative braking," or generating



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About Holman W. Jenkins Jr.

Holman W. Jenkins Jr. is a member of the editorial board of The Wall Street Journal and writes editorials and the weekly Business World column.

Mr. Jenkins joined the Journal in May 1992 as a writer for the

electricity to recharge the batteries for fuel-saving purposes.

That's a lot of software that has to cooperate to decide how the brakes should behave from one nanosecond to the next. Toyota has yet to offer a detailed diagnosis of the latest Prius misbehavior, but it sure sounds like the trouble arises from some unexpected interaction of these systems—on slippery or uneven roads, at low speeds, the brakes reportedly refuse to respond to a driver's foot on the pedal.

Car companies are not insensate to the risk that buggy software poses to customers and shareholders. Ford was instrumental in launching the Motor Industry Software Reliability Association in 1991, and the Society of Automotive Engineers later provided a standard called J2534, allowing any repair shop to "reflash" (update) automotive software from a Windows PC. The SAE also works on standards to minimize electromagnetic interference with vehicle sensors and microcircuitry.

But with cars like the Prius, the forthcoming Chevy Volt and other Obamobiles, electronic complexity will take another quantum leap. We're not just talking about more sensors, algorithms and look-up tables for the purpose of optimizing emissions, but to coordinate two completely different power systems, electric and gas-powered. And coming next are "modular" engines, which use clutch-like devices to link and delink cylinders depending on how much power is needed.

You can also be sure that adding substantially to the cost will be protecting shareholders and executives from legal liability when these systems go bad. Toyota certainly faces billions of dollars in civil litigation in the U.S. Perhaps most concentrating management's mind, however, is the fate of several Mitsubishi executives recently hauled up on manslaughter charges in Japan for failing diligently to investigate defects in delivery trucks that were subsequently implicated in two deaths.

After several trials the Mitsubishi officials were eventually let go with fines, but around the world is a growing appetite for "corporate homicide" laws and prosecutions (Britain passed such a law in 2007). GM, Ford, Volkswagen and other competitors may be indulging a certain satisfaction right now at Toyota's troubles. Perhaps they shouldn't.

editorial page in New York. In February 1994, he moved to Hong Kong as editor of The Asian Wall Street Journal's editorial page. He returned to the domestic Journal in December 1995 as a member of the paper's editorial board and was based in San Francisco. In April 1997, he returned to the Journal's New York office. Mr. Jenkins won a 1997 Gerald Loeb Award for distinguished business and financial coverage.

Born in Philadelphia, Mr. Jenkins received a bachelor's degree from Hobart and William Smith Colleges in Geneva, N.Y. He received a master's degree in journalism from Northwestern University in Evanston, Ill., and studied at the University of Michigan on a journalism fellowship.

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