Hidden Persuaders

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Perhaps it’s misguided to think of the Volkswagen scandal only in terms of its effects on the engineering community. After all, many others have been affected. Our environment has been polluted by diesel engines that claimed to be clean. Widows, orphans, and hedge-fund managers have lost their savings in the fall of Volkswagen stock. Executives will fall from grace as legal and political actions attempt to explain the wrongs and set things right. However, our task is to understand how the technical community might have been damaged by Volkswagen’s efforts to sell a car that was engineered to lie.

At its core, the Volkswagen scandal is a software problem. The modern car is nothing more than a mobile computer that combines processors, sensors, backbones, and data links. Increasingly, we engineer new automotive features by writing a program to exploit the underlying information architecture.

However, one of the fundamental tasks of engineering is to hide. We hide complexity. We hide details. We hide the elements that distract from our creation’s final use. Software, perhaps more than any other form of engineering, takes pride in what it hides by occasionally revealing things that have been carefully masked. We can make users aware of undocumented features, expanded functionality, and even the identities of the software creators. These revelations remind users that the public face of software can conceal a great deal.

Just as software hides the details of engineering, corporations tend to cloak the role of engineers from the public. Very few companies give the engineering staff a prominent public role. Instead, they wrap the engineers in a cocoon and confine their communications to people within the organization: product managers, financial staff, marketing personnel, and risk managers. Within such a cocoon, the Volkswagen engineering staff seemingly accepted software that allowed a car to detect when it was being tested for engine emissions and adjust its output to mislead the inspectors (www.latimes.com/business/autos/la-fi-hy-vw-hearing-20151009-story.html).

At this point, we don’t know the engineering staff’s exact role in the scandal. They might have designed and promoted the fraudulent software, agreed to it under threat of dismissal, or something between those two extremes. My greatest fear is that we’ll find that the engineers embraced dishonesty; that, when presented with a set of constraints, they used their technical skills to find a solution that mislead outsiders without thinking about the ramifications of their work. They couldn’t see the fraud because it was outside the task at hand.

An early version of the ethics statement of the Institute of Radio Engineers (IRE), IEEE’s precursor, instructed members to determine the legitimacy of all enterprises with which they connect themselves: “If, after becoming associated, [any member] finds them to be of a questionable nature [they] should sever [their] connection as soon as possible.” It’s good advice, if somewhat naive. Evil lies. It tells us, in a most charming voice, that it’s attempting to accomplish the most noble of goals and that it would be most grateful for our technical help. Perhaps most frighteningly, it can hide in our own thoughts and make us believe that we’re creating a solution when we’re actually creating a problem.

We won’t have a clear picture of the Volkswagen story for months, if not years. Given the nature of the problem, we might have to accept the conclusion that reports will affix some blame to the engineering community. These reports might conclude that if engineers can make technology tell the truth, they can also make it lie. Such a statement would capture the lesson that we must impart to the next generation of engineers: lies are more subtle than we think. They can hide in our products, our companies, and even our own best-engineered thoughts.

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