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Posterminaries: Business Lessens

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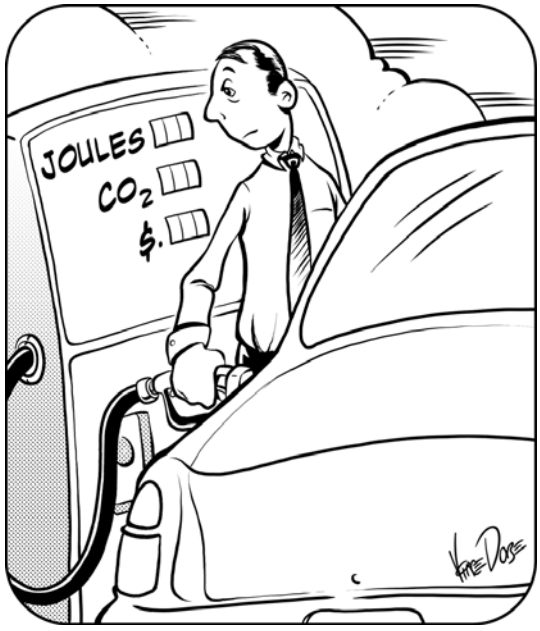
Abstract
Let there be no mistake about it: The news business is in trouble. Once it was powerful enough to have been identified as an unofficial branch of government in the United Kingdom (the "fourth estate") and accorded its own mention in the First Amendment to the U.S. Constitution, but today the press is in a steep decline. Newspapers are failing across the world and those that survive are getting very lean.

Disciplines
Materials Science and Engineering

Business Lessens



Let there be no mistake about it: The news business is in trouble. Once it was powerful enough to have been identified as an unofficial branch of government in the United Kingdom (the "fourth estate") and accorded its own mention in the First Amendment to the U.S. Constitution, but today the press is in a steep decline. Newspapers are failing across the world and those that survive are getting very lean.

One easy explanation for the decline is that the Internet has destroyed the business model of the classic newspapers. When the Internet was a novelty, newspaper publishers began to post content on the web free of charge, without much concern about the impact on newspaper sales. It is now clear that this was a mistake born from a misunderstanding of what is actually being sold. A newspaper is a means of selling information, and a medium for selling advertising space. The paper itself is incidental, and can clearly be replaced. The business managers of the press fooled themselves into thinking that they were in the business of printing stuff on paper and then selling the paper, and this is understandable, given that the term "press" refers to the printing press. But what the customers were buying was news, not paper. Suddenly there was an alternate source, and it seemed to be free—at least to the consumers.

The message for the rest of us, whatever business we think we are in, is that we need to understand what the consumers are really buying, and avoid getting distracted by the medium through which we sell it to them.

So here is a modest suggestion. If we really believe in an "energy economy" then we should all stop buying gallons of gasoline, cubic feet of gas, or tons of coal, and start buying megajoules of energy. This will not be easy to do, even though reprogramming the gas pumps is not a big problem. There is always resistance to change. In the United States, we still travel by the mile and weigh by the pound, despite the Metric Conversion Act that was signed into law by President Gerald Ford in 1975. Colleagues in the aerospace industry, where unit confusion has a history of being deadly, sometimes refer to the foot-pound-second system as "Christian units," and carry on using them as though SI had never been invented. Still, if we can overcome consumer resistance and corporate inertia, and go over to energy units world wide, then there is some hope of reuniting Europe and the United States so we can all measure our automobile consumption in megajoules per kilometer instead of miles per gallon or liters per 100 km. I will settle for megajoules per mile. Just to benchmark things, a car that travels 30 miles per U.S. gallon of regular gasoline consumes about 4 MJ/mi or 2.5 MJ/km. Those are pretty easy numbers to cope with.

This matters because, just as in with news, the medium of delivery can change. You can already buy gasohol instead of gasoline for your car in some parts of the world, but you purchase either of them in gallons or liters, even though the gasohol contains about 2.5% less energy per unit volume, and produces correspondingly poorer mileage. Maybe that is a small matter, but in the near future you may be able to use much higher concentrations of ethanol if you buy a flex-fuel vehicle, and I would rather know how much energy I am buying than how many gallons of a fuel, when one option could provide as much as 25% less energy per gallon than another fluid from the same pump. Switching between biodiesel and fossil-based diesel offers similar trade-offs, with up to 15% difference in energy per gallon. If you add the complication of a plug-in hybrid, so you can also choose between electrical energy and chemical energy, you should still be measuring the amount of energy that you buy, so I can compare apples to apples. Of course, I am simplifying. I am assuming that cars operate with the same efficiency on any fuel, which is not true yet, but is likely to be the case, eventually.

W. Edwards Deming said that one of the seven diseases of management is using the visible figures alone, and this is usually interpreted as "you can't manage what you don't measure." If you want to manage energy, measure energy, not gallons of fuel. Please do not brag that your plug-in hybrid gets 100 miles per gallon if we also have to burn coal to charge its batteries. Tell me how much energy it consumes per mile.

Selling what the consumer is really buying is good practice, but when a consumer buys energy the rest of us get some other things too, most notably carbon dioxide. The world's governments are trying to come up with ways of controlling CO_2 emissions, but here is an interim suggestion: Inform consumers how much CO_2 they are getting with every megajoule they buy. Burning coal produces nearly 100 grams of CO_2 per megajoule. Liquid fuels like gasoline and diesel are in the range of 65–70 g/MJ, and natural gas is down around 50 g/MJ. The differences between gasoline, gasohol, diesel, and biodiesel are small enough that their CO_2 content will not drive any particular consumer decisions at the gas station, but when it comes to coal-derived electricity, the numbers might prick a few consciences, even while the cost per megajoule is attractive. Electricity is derived from a variety of sources, not just coal, and each one has a different CO_2 burden, but electrical energy suppliers know precisely how much of their product comes from each source and can easily determine the average amount of CO_2 released per megajoule that they deliver. I think their consumers might react to this information. The U.S. Food and Drug Administration reports that nutrition labels on food products affect the consumer's choice in roughly half of all cases, so how about CO_2 labels on our energy products?

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