

## **Response to Charles Mann**

So, you want to know why the quality of software is so poor. The answer is one word: fear.

### **Executive Fear**

The software companies could not get away with dumping buggy, bloated software on John Q. Public without the complicity of their largest customers: corporations, government agencies and educational institutions. Good old John Q. does not have buying power to force quality improvements. Large buyers do.

But, the managing cohort in most large organizations is the 40 to 65 year old crowd, and most of them are uncomfortable with information technology. Meanwhile, subsequent generations, with brilliant marketing support from the software giants, have equated information technology with being young and cool. Anyone who can't master it is a dinosaur. And, those who question its value or its performance are probably doing so only because they don't "get it."

So, the old geezers running our largest enterprises, who fear nothing more than being perceived as old or not hip, won't admit what they don't know or don't understand, and just accept without protest goods and services of abominable quality with all kinds of features (oh, did I say "features", I meant "functionality") that their enterprises don't need.

A corollary of the rule that anyone who questions information technology must be brain dead from listening to too many Montavani records is the rule that "functionality" is always good.<sup>1</sup>

### **Career Path Fear**

Most large organizations have now appointed Chief Information Officers and have been forced to recruit and maintain large in-house support staffs. As best as I can determine, the role of these folks is to address the problems posed by the software as best they can, which is never very well. This is why they spend virtually all of their time retaining "consultants."

The consultants are the ones who know everything. The in-house staff knows virtually nothing, even though they all used to be consultants (it is as if they all had pre-frontal lobotomies on their way to their first day of work). And, guess what the consultants know? They know that the software you're running is obsolete and the new version, with greater functionality of course, would solve all of your problems.

So, the consultants are apologists and salesmen for the software industry, and the in-house staff feeds and cares for the consultants. Why? Well, CIO is not a job that

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<sup>1</sup>As an aside, I tried to take advantage of the success the IT folks had in convincing management of the value of "functionality" by pushing for the IT department to run our company car program. After all, if 8 cylinders are good, 12 must be better. Why should I accept 4 forward speeds (4 speed automatic transmissions have been available since Grover Cleveland...OK, George Bush's father... was president. Same difference.) when 6 speeds are available. What good is a car with a top speed of 140 mph when the hottest new cars max out at over 200. I want my Ferrari!

leads to the CEO's office. Without an upward career path within the organization, the stature of the CIO is measured by the size of the IT staff and its budget. The perversity of this incentive is self-evident.

In other staff departments (where upward career paths may also be limited and where staff and budget size are surrogates for performance) the CEO is the countervailing force. He or she vets your budget and must approve every significant decision or expenditure. The problem with the IT department, however, is that the CEO, cowed with fear of being seen as a "has been", does not function in the role. Everything the IT department wants, it gets. (Well, almost everything, the CEO has to push back a little, in part to demonstrate that he or she really, really understands this stuff. Really. He or she "gets it." Has a computer at home and everything. Let's the kids play video games, too. Really.)

Meanwhile, the consulting firms provide job security for the IT folks. It is the age old "revolving door." "When I'm in-house, I'll hire you and then you can do the same for me someday." And, the entire scam depends on, desperately needs, poor quality software.

### **Commodity Fear**

#### **Fear in the Hardware Industry**

Look at the "technology" industry. On the hardware side, you have products that can be mass produced in any third world country by contract manufacturers employing unskilled labor. The companies in this business spend a lot of money obtaining patents and fighting over alleged infringements. But, let's face it, there is no effective (in the sense of being capable of legal protection) intellectual property here.

Moore's infamous law, which holds that computational power doubles and prices halve every 18 months, demonstrates beyond any doubt that what we have here is a commodity.

Prices for products with effective patent protection do not fall by 50% every year and a half. They don't fall at all. That's the point. As compensation for publicizing the invention, the patent holder has a monopoly for the patent term. Only idiots with monopoly power reduce price 50% every 18 months. Has Pfizer lowered the price of Viagra 50% in the last 18 months? I didn't think so.

A commodity product means commodity profit margins. Over the long term, prices rarely exceed costs of production by much (to be accurate, assuming unlimited production capacity of the competitors, prices should not exceed production cost plus the weighted average cost of capital of the most efficient producer). This means that often it is not possible to make a profit at all (unless you're a third world contract manufacturer with access to large pools of slave labor). Typically, companies in commodity businesses are valued at relatively small (like, less than 10) multiples of earnings.

So, what is the hardware manufacturer to do? One way to avoid price and margin deterioration is to constantly introduce new products, for which you can get a premium price for at least a little while. That's why we get new car models every year. Usually, however, the "new and improved" product strategy doesn't help all that much, though, because once consumers have a product that meets their needs

they are loathe to purchase a new product.<sup>2</sup> That's where the software companies and their poor quality product come in.

### Fear in the Software Industry

Like hardware, software is a commodity. I'm writing this on Sun's StarOffice suite, a suite of applications comparable to Microsoft's Office.<sup>3</sup> I paid absolutely \$0 for StarOffice. That's right, nada, nothing, zip. I think that Sun recently raised the price to something like \$39, but I predict the price will fall back again to its proper level, \$0.

While I'm running Windows 2000 on this laptop (because my firm provided it for free), I run two other boxes, one a laptop and one a desktop, on Linux. I admit that I paid for Linux, even though I could have gotten it for free, for the convenience of packaging and support information. And, I have StarOffice suite on each of them.

So, Microsoft has competitors - one for operating systems and one for an office suite - who are giving their products away. What does that make the Microsoft products worth? That's right, \$0.

This is consistent with the fact that Microsoft has no effective intellectual property protection for its products other than brand equity. For the average user, there's more difference between a Ford and a Chevy than between StarOffice and Office or between Linux and Windows.<sup>4</sup> There are, of course, vast differences in the details of the programs and how you configure them for complex tasks. Windows, for example, is a lot easier than Linux to set up, but more prone to trouble when running. It's a wash. The average user who only needs browser, email, simple word processing and a simple spreadsheet, never does any complex tasks. The bottom line is that to Joe Sixpack and Jane Longnails, both Windows and Linux show a screen with icons they can click on, menus they can pull down, etc.

On a more academic level, Microsoft's marginal variable cost for its products (the cost to produce each additional copy of its programs) is essentially \$0. Any academic economist will confirm that a product with an extremely low marginal variable cost is a potential commodity. And what is true for Microsoft is true for all software manufacturers.

So, faced with this problem, the software industry has followed the standard script for commodity product sellers. Make lots of "new" products to create demand at premium price, build brand equity, and push the limits of competition law in the

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<sup>2</sup>Another way is to create brand equity and build the value of the brand name (which is how Coke is able to sell its cola for a little more than the generic competing product). Trademarks are another form of intellectual property and they can have significant value. Unlike patents, properly protected trademarks do not expire. Intel has had limited success with this strategy, as have some of the high-end audio and video card makers.

<sup>3</sup>This is not an anti-Microsoft screed. I happen to like the Sun word processing application better than Microsoft Word because certain utilities I need are notoriously "buggy" in the Microsoft product. On the other hand, I prefer the Microsoft browser to that supplied by Sun. And, as discussed later, poor quality in the Microsoft products makes good business sense for Microsoft.

<sup>4</sup>A user is not limited to Linux and SunOffice as replacements for Windows and Office. There are many free or low cost alternatives to the Microsoft products. I've used these as examples because they are widely known and (at least when acquired by me) free.

distribution channel.

It is the focus on "new" products that causes our current software quality problem. To fight commoditization of their products and deterioration in their margins, software manufacturers have (rationally) introduced many products that add new features.<sup>5</sup> The new features simply distinguish the latest product from the prior products. They also happen to have the collateral benefits of: 1. imposing (however inefficiently) greater demands on the hardware, allowing the hardware manufacturers to come out with new products of their own, and 2. necessitating additional support and training requirements, thereby increasing demand on the service (consulting) side of the industry. Thus, with apologies to Disney, the Circle of Life in the technology industry remains unbroken.

One thing that software manufacturers have very little incentive to do is to improve quality. All that would do would be to lengthen product cycle time and make the decision to upgrade harder to justify and new products harder to sell. Worse, there are collateral consequences of improved quality. Demand on hardware performance would decrease (or at least not increase) making it harder for the hardware segment to successfully introduce the new products it needs to sustain its margins. And, demand on the service side would decrease and both the hardware and software segments would lose their unpaid sales and marketing staffs (the consultants).

The comparison of the technology industry at the dawn of the 21st Century to the automobile industry in the middle of the 20th Century is instructive and predictive. In the 1950s and 1960s, Detroit gave us fins, chrome, engines of vast power (and low efficiency) and very poor quality. At the same time, Detroit realized high margins on these poor products. Ultimately, consumers matured and forced the industry to provide products of greater value – at lower price. Now cars last longer and are (relatively) much cheaper, while the auto manufacturers are afflicted with commodity margins and hover on the verge of bankruptcy (largely because of cost structures adopted during the "good old days"). The same will happen with information technology. The "solution" to the software quality problem is to realize that "this, too, will pass."

Litigation to force software quality improvement is unlikely to be successful, because judges have the same fears and prejudices as their counterparts in industry and government.<sup>6</sup> The current fascination with information technology is a social phenomenon like the fascination with fins and chrome of 50 years ago. The legal system reflects the society in which it operates and is resistant to changing those things that society is willing to accept and that do not need to be changed.<sup>7</sup>

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<sup>5</sup>As the technology industry has so carefully and successfully introduced into our society the fear of obsolescence and the loathing of technophobia, it has been able to limit or avoid traditional economic constraints on this strategy. In other words, company leaders so fear being seen as dated that they'll buy the new bells and whistles whether or not they add value and at ridiculous prices (just as teenagers – desperate to be seen as "cool" - buy shirts and sneakers displaying the "right" emblems at vast multiples of fair price).

<sup>6</sup>Whatever a particular jury might do, any substantive trend in the law of significance will have to be based on decisions of appellate courts reviewing trial court results.

<sup>7</sup>When I was in law school twenty years ago, I suggested applying products liability principles to cigarette manufacturers, not because I believed that cigarette manufacturers should be liable for sick smokers, but to demonstrate the absurdities of the strict products liability doctrine. My suggestion was ridiculed by the professor, even as a potential future extension of products liability law for purposes of analysis. He

[Note: Microsoft, Windows, Word, Office, Sun, StarOffice, Linux, Chevy, Ford and Disney are all registered Trademarks or Service Marks and are the property of the respective mark holders.]

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couldn't imagine courts every imposing liability on cigarette manufacturers. Of course, this was more than 20 years after the adverse effect of cigarettes on health (not just cancer causation) had been accepted by the scientific community.