

Inside Intel: The Pentium Glitch

The following scenario is becoming increasingly common in the commercial world of computers and computer chips: A product is released for sale that has a few known "bugs." (See 1947 "Grace Hopper" on page 337 for the origin of this term.) The manufacturer faces a difficult dilemma: Do you hold up the release of a product until you can find and fix its bugs, or do you release the product for sale, hoping that the bugs won't cause many people trouble? The pace of innovation in these fields is so rapid that product lifetimes are no more than a few years, so holding a product back may cause the company to lose much of its share of the market. On the other hand, releasing the product with a bug may anger important customers. So what do you do?

A famous example of a bug in a microprocessor chip is the Intel Pentium incident. Intel, a leading maker of microprocessor chips, developed a new, fast microprocessor chip that it dubbed the "Pentium." In 1994, at just about the time it was running newspaper and television ads built around the theme "Intel Inside" to show which computers contained Intel chips, a research mathematician in Virginia reported that the Pentium could produce wrong answers in complex division problems. The reason was that some numbers had been left out of a table on the chip that contained certain division results. The question was, what was ethical and prudent to do about it?

Apparently hoping that the problem would just go away, the company at first asserted that the glitch would affect very, very few users. The company initially refused to simply replace old flawed chips with new corrected chips. Customers who sought replacements were queried about what kinds of computations they did routinely in order to weed out replacements for those unlikely to trigger wrong results.

After much critical airing in the press, Intel eventually agreed to exchange all flawed Pentium chips. The company also agreed to expand on its previous policy of confidentially informing computer manufacturers about known flaws in its chips; now, after the computer-makers have had the information about flaws for 30 days, the information is released to the general public. Threatened lawsuits were dropped, information about chip and circuit board flaws were posted on the Internet, and the price of Intel stock rose.

To make complex devices that work perfectly is extremely difficult, even though manufacturers use programs that "exercise" their products to ensure that they perform correctly. What was learned from the Pentium incident was that it's important to deal responsibly with flaws as soon as they're found. Was Intel alone in this situation? Not at all. In just the next year, a popular income tax preparation program was found to have a serious flaw, and security on a widely used network access system was shown by outsiders to be easily breached. In this last case, the company took quick action, admitting the problem, generating corrective software quickly, and finally enlisting the aid of its customers by offering a cash payment to anyone who found new bugs in its product.