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Whither the Five-Cent Tag?

It's been nine years since MIT Professor Sanjay Sarma, then also research director of MIT's Auto-ID Center, published a landmark paper about RFID called "Towards the 5¢ Tag," in which he claimed "to convey the key ideas which we believe will enable the first 5¢ tags." (Full disclosure: I encouraged, supported and loudly advocated for his position.)

At that time, each RFID tag cost 50 cents to a dollar. Tags were made in such a way that they could never cost as little as five cents apiece, no matter how large the volume. In fact, producing really large volumes would be challenging even at a dollar a tag, because of the time and machinery required. Manufacturers needed a way to increase volumes and decrease costs if the vision of RFID everywhere—even in inexpensive consumer goods—was to be realized.



The paper provoked very strong reactions. People who believed in the vision were pleased there was finally a well-reasoned argument for cheaper RFID. People who didn't were outraged. We were accused of being irresponsible, of sabotaging the RFID industry and worse. One expert said "there isn't enough silicon in the world" to make so many tags.

Sanjay showed, in his beautifully straightforward way, that reducing the price of RFID tags was just a matter of overcoming a series of manufacturing problems. Chips needed to be made smaller and simpler. Smaller chips needed new approaches to "packaging," the process by which they are picked up and placed into a circuit. Antennas needed to be made more simply and inexpensively, too.

Finally, the packaged chips needed to be affixed to the antennas as cheaply as possible. If new, low-cost, high-volume approaches could be developed for each of these steps, then tags could be made in volume for as little as five cents. The paper described companies and research labs worldwide that

were developing promising solutions to each of these problems. "The goal of the 5¢ tag," the paper concluded, "is difficult but achievable."

Today, tags are much less costly than any of the skeptics ever imagined. According to one recent report, even in volumes as low as 10,000 units, tags can be bought for as little as 12 cents this year, with an average price around 15 cents. But these numbers don't tell the whole story. "We can buy and sell inlays for around 5 cents today in volume," one prominent RFID vendor, who asked not to be named, told me. Pricing depends heavily on volume, size and encoding method. With these factors in mind, he estimates that volume prices are currently around six cents.

Skeptics will be quick to point out that six cents is quite a lot more than five cents—20 percent more, to be precise. But they are not factoring in inflation. What was six 2010 cents worth in 2001? That'd be five cents. I'd say Sanjay Sarma was right—or at least pretty darn close.

Kevin Ashton was cofounder and executive director of the Auto-ID Center.



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