TECHNOLOGY:

Micropayments: Is the Nickel-and-Dime Approach Gaining Currency?

By: **Focus Staff**

When it comes to micropayments, it's déjà vu all over again. The Internet boom, after all, first introduced the notion of micropayments, where a consumer can pay for Internet-provided digital content in incremental amounts – anywhere from a few dollars to a few cents. And when the bottom fell out of the market, a number of micropayment companies fell with it – Flooz, Beenz, Digicash, and CyberCash, to name a few.

But in the past few months, a handful of companies have made it clear that they have not yet given up on the microtransaction market. Is the time now ripe for micropayments?

The Market for Micropayments

In an effort to provide consumers the opportunity to buy an ever wider array of digital content – and to ensure that artists, musicians, and other content providers have the opportunity to profit from their creative endeavors – the idea of micropayments was born.

According to *The Globe and Mail*, "Credit card transactions average \$100. Debit charges average \$43. Underserved by plastic are deals in the \$1-to-\$20 range"[1] – and lower.

This is mainly because credit card transaction costs are prohibitive where the purchase of inexpensive items is concerned. Most credit card payment systems charge anywhere from 30 cents to \$2 to process a transaction. For an item that costs, say, a quarter, profit would be impossible.

But a new crop of companies is looking to make micropayment transactions efficient. The trick up their sleeves? Easy-to-use technology that processes these small payments in batches, thereby making them more cost effective for merchants.

Micropayment Models

When it comes to micropayments, there are at least three competing approaches to collecting, transferring, and authenticating payments: direct-to-bill, prepaid accounts, and merchant aggregation.

PaymentOne, based in Silicon Valley, allows consumers to make small purchases online. The charges for these purchases appear on the consumer's local phone bill.

BitPass of Palo Alto, California, and Paystone Technologies of Vancouver, British Columbia, require users to establish prepaid accounts. When a consumer makes a purchase, the amount of that purchase is then debited.

Peppercoin, headquartered in Waltham, Massachusetts, eschews prepayment for an innovative technology twist: algorithms.

Peppercoin's founders Ronald L. Rivest (the "R" in RSA, the public-key inscription system), and Silvio Micali (who was awarded the 1993 Godel prize in theoretical computer science), have found a way to enable consumers to pay as they go while also limiting the cost of transaction processing to less than 10 cents.

The secret? A patent-pending method that lumps individual transactions together into one larger transaction, reducing the cost to the merchant.

Algorithmic Activity

"It looks simple to the buyer, who only has to click on an icon to charge an item to her Peppercoin account, but the action behind the scenes is pretty complicated. … [S]pecial encryption software runs on

© 2004 Capgemini. All rights reserved.

both the buyer's and seller's computers, protecting their interactions from hackers and eavesdroppers. And encrypted in each transaction is a serial number that says how many purchases the customer has made over time, for how much, and from whom," *Technology Review* explains.[2]

Only one transaction out of 100 is fully processed – the other 99, though, are still recorded by the seller's computer – and that one transaction, which is chosen at random, is forwarded to Peppercoin. "After Peppercoin pays the seller 100 times the value of that transaction, it bills the customer for all of her outstanding purchases from all sites that use Peppercoin. Since about one out of a hundred purchases is processed, her last bill will have come, on average, a hundred purchases ago. That's the trick: by paying the seller and charging the customer in lump sums every 100 purchases or so, Peppercoin avoids paying the fees charged by credit cards – roughly 25 cents per transaction – on the other 99 purchases,"[3] *Technology Review* reports. Furthermore, with large transaction volumes, any errors that might crop up in such sampling are negligible.

Of course, this flurry of algorithmic activity is unseen by the consumer. In fact, consumers are not even required to register with Peppercoin before they make a purchase. Peppercoin's relationship is with the merchant and its technology enables these merchants to sell and process inexpensive goods profitably.

Skeptics Persist
Still, when it comes to micropayments, skeptics persist.

Walter Nirenberg, vice president of sales for San Francisco-based Yaga, a company that handles online payments for archival content (Time.com, for example), tells *The New York Times* that, "No merchant is going to meet their revenue goals with micropayments. We see them as a commerce-enabler. But if your business were predicated on them, you'd have a microbusiness."[4]

Some critics maintain that, due to the fundamentals of economic psychology, selling Web surfers en masse on micropayments will never happen. As computer scientist Nick Szabo suggested during the first incarnation of micropayments, [5] "mental transaction costs" prevent most people from investing their time in deciding whether to purchase individual, inexpensive items. That's precisely why subscription models and bundled offers (to buy 10 articles for $15.95, for example) abound on the Internet.

Clay Shirky, technology columnist and adjunct professor at New York University, explains in the *E-Commerce Times* that, "Everybody who imagines doing micropayments is basically thinking about forcing users to pay a little here and a little there. Literally, they're nickel and diming them. … [And] users just don't like it." Furthermore, Shirky points to the online porn industry, "which has tried on several occasions to adopt a micropayment strategy akin to the 25-cent peep-show booths in the offline world. 'They can't make it work online. And those guys are the e-commerce geniuses, so if they can't do it, who can?'" [6]

Finally, many doubters point to the graveyard of failed micropayment companies and wonder, didn't the Internet bust teach us anything?

Thank the Dot-Com Crash
Yet others maintain that the Internet bust is precisely what paves the way for the success of micropayments this time around.

According to Brian Roberts, Paystone vice president, and as reported in *E-Commerce Times*, "In the days of the dot-com euphoria, Web sites did not have to generate revenue to increase their stock price. [But now] companies are desperate to generate revenue from their content. In fact, the dot-com crash was a positive thing for the micropayment industry."[7]

In the 1990s, the Internet was so saturated with free content that there was little point in charging for anything – no matter how low the price. But the concept of a totally free Internet is beginning to fade as an increasing amount of online content is available only by subscription.

© 2004 Capgemini. All rights reserved.

In addition, consumer expectations are becoming more in line with – and accepting of – micropayments. For that, many experts thank the widespread popularity of Apple's iTunes and other music-downloading businesses.

Finally, easier-to-use technology and a growing number of broadband Internet connections make for a landscape that is more conducive to buying digital content a la carte.

The Potential for Micropayments

In a study conducted by Peppercoin and Ipsos-Insight, researchers found that "more than 10 million Americans have purchased digital content for less than $2 in the past year according to a comprehensive, quantitative survey on the micropayments market. This represents a nearly 150% increase over the four million consumers who indicated they had purchased low-priced content online in a similarly conducted October 2003 research study."[8]

Still not convinced? Then look overseas to Asia and Europe, where micropayments are becoming increasingly widespread. In Japan, cell-phone users are downloading and paying for games and ring tones via micropayments. Micropayments are also catching on in Europe's publishing and new media markets.

Further potential – and another frontier – for micropayments exist in the offline world. For example, Incredible Technologies, the manufacturer of the Golden Tee, a coin-operated arcade game, captured more than $350 million in small cash payments in 2003. Incredible Technologies recently opted to accept consumer payments via credit card and has partnered with Peppercoin to make this possible.

Not to be overlooked in the offline world, of course, are mobile and contact-free payments. We've already seen contact-free payments at the gas pump with Mobil's SpeedPass and Shell's EasyPay. Small cash transactions at fast-food restaurants, parking garages, convenience stores, and movie theaters will easily make the transition to this model as well.

In fact, by 2009, TowerGroup expects "the total market for Internet and mobile micropayments in the US to increase 23% to $11.5 billion in revenues, up from just over $2 billion in 2003."[9]

The Future Landscape

If the potential for micropayments is all that its proponents claim it is, Internet content will become richer and content-creation businesses will thrive. And cell phones, smart cards, and personal digital assistants will be equipped with micropayment technology that can supplement cash in the physical world. (In July of this year, NTT DoCoMo, Japan's largest mobile operator, introduced the first wallet phone. The phone is equipped with a smart chip that a scanner reads.)

In sum, small change will no longer be an impediment to buying and selling content and items, or taking part in activities (such as playing an arcade game). And who knows? Someday, small change may no longer even jingle in our pockets.

---

[1] David Ticoll, "Technology firms jostle for pocket change," *The Globe and Mail*, November 20, 2003.
[2] Gregory T. Huang, "The Web's New Currency," *Technology Review*, December 2003/January 2004.
[3] Ibid.
[4] Anne Eisenberg, "A Virtual Cash Register Rings Up Tiny Transactions," *The New York Times*, January 7, 2004.
[5] Nick Szabo, "The Mental Accounting Barrier to Micropayments," 1996.
[6] Elizabeth Millard, "The Death of Micropayments?", *E-Commerce Times*, January 12, 2004.
[7] Ibid.
[8] "More Than 10 Million Americans Have Purchased Items Online for Less Than Two Dollars in the Past Year," *Business Wire*, July 14, 2004.
[9] Tower Group Press Release: "Internet and Mobile 'Micropayments' to Grow 23% to Over $11 Billion Market in US by 2009," August 2, 2004.

© 2004 Capgemini. All rights reserved.